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PREFACE.

It is a common subject of complaint among amateur florists, that the directions for the culture of flowers given in works on Gardening are scattered through so many different volumes, and mixed with so many other matters, as to be of comparatively little use to the possessors of small gardens. Having felt this inconvenience myself, it occurred to me that a Dictionary of the English and botanic names of the most popular flowers, with directions for their culture, would be useful; and the result is the present volume.

J. W. L.

Bayswater, 1841.

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Abu'tilon. — *Malvàcea.* — The herbaceous plants belonging to this genus are scarcely worth cultivating, but there is a very beautiful greenhouse plant called *Abùtilon striàtum*, that deserves a place in every collection. This plant is a native of Brazil; and it is a half-shrubby climber, with vine-like leaves, and bell-shaped flowers of a bright yellow, strongly veined with scarlet, which hang down on long slender stalks. The plant should be grown in a pot, a quarter filled with broken potsherds, to ensure perfect drainage, in a light sandy loam; and it should be trained to a slight frame: or it may be planted in the open air, and trained against a wall or trellis, as it is nearly hardy, and only requires protection from frost.

Aca'cia.—*Leguminòsæ.*—Most persons understand by the word Acacia, tall trees with pea-flowers, which are natives of North America, and quite hardy in the open air in England. These trees, however, are the Locust trees, or false Acacias, and belong to the genus Robinia. The true Acacias are what are called Wattle trees in Australia, with flowers like balls of golden down; and as *they require protection from the frost in* England, they are generally treated in this country as greenhouse shrubs. Above three hundred species have been introduced; but only about thirty are in cultivation in British nurseries, and nearly all these have been figured in the botanical periodicals. By far the greater part of the Acacias grown in England are natives of New Holland, and most of these are nearly hardy; but some are from the East Indies and Arabia, and most of these require a stove. Nearly all the kinds are evergreen; and the Australian species are very valuable in greenhouses, because they are in flower during winter. In the open ground they flower in March, April, May, and June. The following kinds are those most common of the Australian Acacias in British nurseries:—*A. armàta*, a compact growing plant, with simple leaves and abundance of flowers, but very apt to be infested with insects; *A. alàta*, a curious species with leaf-like stems; *A. decípiens*, with small angular leaves; *A. diffùsa*, a dwarf plant with small flowers; *A. hýbrida*, very fragrant; *A. longifòlia*, with very long leaves, and the flowers not in balls, but in long close spikes; *A. pubéscens*, a very elegant species with drooping branches, pinnate leaves, and the ball-like flowers disposed in racemes; *A. nìgricans*, with blackish green foliage; *A. verticillàta*, with the leaves like spines, and disposed in whorls; *A. lophántha*, with pinnate leaves, and long spike-like whitish flowers; *A. dealbàta* Cunningham, the *A. affìnis* of some, remarkable for the delicacy of its foliage, and the whitish bloom which covers its trunk and branches; and *A. melonóxylon*, the Black wood, or Black Wattle of the Australians, the dilated petioles or phyllodia of which look like leaves, with the real leaves, which are pinnate, attached to their extremities. Of the other kinds of Acacia, the hardiest are *A. acanthocárpa*, a native of Mexico, with pale pink flowers and spiny pods; and *A. Julibríssin*, the silk tree, a native of Persia, and one of the most beautiful small trees that can be imagined: the flowers are like long silk tassels, and they vary from a pale pink, or rose colour, to a delicate lilac; but they seldom attain perfection in the open air in England for want of heat in our summers, though they are extremely beautiful in Italy. Of the stove species, the handsomest are *A. speciòsa*, *A. grandiflòra*, *A. Houstòni*, and *A. scándens;* and they should all be kept in the coolest and most airy part of the stove. *A. vèra*, the Gum Arabic tree, *A. Cátechu*, from the unripe pods of which is made the substance called terra japonica, and *A. Senègal*, the Gum Senegal tree, are only interesting for their products.

All the kinds of Acacia require to be grown in sandy loam, or in a mixture of sand, or peat, and leaf mould, well drained. They are generally propagated by imported seeds, (though some of the species have ripened seed in this country,) and the seeds are sometimes two, or even three, years in the ground before they come up. To hasten their vegetation, they may be steeped in very hot water, and left in the water for several days, or in oxalic acid and water, and sometimes even boiled; and when prepared by any of these modes, they will generally come up in about a week or a fortnight. Acacias may also be propagated by cuttings; but as these are rather difficult to strike, they should be put into a pot filled with pure white sand, covered closely with a bell-glass, and then plunged into a hotbed. The tenderer species may also be grafted on *A. dealbàta*, *A. lophántha*, and *A. melonóxylon*, which appear to be the hardiest kinds. All these three species will generally spring up again from the root, when killed down to the ground by frost; and whenever this is the case, it indicates that the plants may be propagated by cuttings of the roots, which is frequently done with these Acacias. All the roots of the Australian species smell like garlic, and this smell is very perceptible on entering a room where any of these plants are kept, if it has been shut up for a few days. For this reason, when Acacias are kept in a greenhouse adjoining the living rooms of a house, care should be taken to give the house abundance of ventilation; and this is also very conducive to the health of the plants.

Aca'cia.—See Robinia, Mimosa, and Inga.

Aca'nthus.—*Acanthàceæ.*—Perennial plants, natives of the warm parts of Europe, two of which, *A. móllis* and *A. spinòsus*, deserve a place in every collection from their stately appearance, and from the legend of their leaves having given the first idea of the capital of the Corinthian order of architecture. All the kinds of Acanthus require a sandy soil, and a good deal of room; and they are all readily increased by division of the root, and by seeds. The situations most suitable for a large plant of Acanthus are near a stone seat on a lawn, at the foot of a block of stone introduced among rock-work, or among classical ruins, such as those at Virginia Water, Windsor, &c. In a garden at Hammersmith, a fine effect was produced, some years since, by a noble plant of *Acánthus spinòsus* springing from the base of a shattered pedestal, and half concealing the broken statue that had fallen from it.

Acarus.—A genus of small insects or mites. *A'carus telárius*, the red spider, is one of the most troublesome of all insects to gardeners, particularly in the bark-stove, as it breeds in the bark. When first hatched this little creature is scarcely perceptible, as its colour is of a yellowish green, and it spins its web on the under side of the leaves. As it gets older, it becomes of a brownish red. It has eight legs, and belongs to the spider family; but it is provided with a kind of proboscis or rostrum, with which it sucks the juices of the leaves it lives upon, and soon withers them; thus spoiling both fruit and flowers, as neither can attain perfection unless the sap that nourishes them has been properly elaborated in the leaves. It is very difficult to destroy this insect, as tobacco-smoke and the other remedies generally used against it, appear to have very little effect. Sprinkling with cold water will sometimes destroy it; but as the insect is generally produced by keeping the plants too hot, and not allowing them sufficient air, the best remedy appears to be to set all the hothouse plants in the open ground during the months of July and August, plunging the pots in a bed of dung, decayed leaves, or tan; and well ventilating and cleaning the houses while they are empty.

Achille'a.— *Compósitæ.* — Milfoil. — The plants *belonging to this genus are known under the* English name of Milfoil. Most of them have no great beauty, but they are of very vigorous growth, and will grow in any soil or situation, bearing either smoke or cold without any visible change. They are also suitable plants for balconies or boxes, as they are not easily injured either by too much watering, or by being kept too dry. The most ornamental of the vigorous growing kinds are *Achillèa tomentòsa*, the woolly Milfoil, with yellow flowers, and *A. tanacetifòlia* with red flowers. Of the more delicate species, *A. Clavénnæ*, the silvery-leaved Milfoil, with large white flowers, is a very pretty little plant for rock-work; but it is rather difficult to keep, unless it be grown in a dry soil and a shady situation. *A. aúrea*, which scarcely grows half a foot high, and has rich yellow flowers, which it produces in great profusion, is very suitable for edgings to beds and borders; as well as for growing in pots and on rock-work. The last species grows freely in any soil that is tolerably dry; and they are all readily increased by division of the root.—(See Division.)

Aconi'tum. — *Ranunculàceæ.*— Monkshood and Wolfsbane.—Herbaceous perennials, chiefly natives of Europe, but partly of North America and Japan. They are all hardy in British gardens, and they are generally tall-growing handsome plants, producing abundance of dark-blue, purple, or yellow flowers. They will all grow freely in any common garden soil, and are readily increased by division of the root, or by seeds. All the species are more or less poisonous, the poison being strongest in the root. Like all plants which grow with tall erect stems, and produce their flowers in terminal spikes, they are only suitable for growing in borders in large gardens, or for clumps on a lawn. Some of the most common and handsomest species are *A. Napellus*, the common Monkshood, with intensely dark-blue flowers, the root of which has frequently occasioned death, from having been eaten by mistake instead of celery; *A. ánthora*, the wholesome Wolfsbane, with very handsome yellow flowers, and the root of which, though poisonous in itself, is said to be an antidote to the poison of the common Monkshood; *A. ochroleùcum*, with pale yellow flowers, which are more curious than handsome, and *A. septentrionàle*, a beautiful plant with dark purple flowers tipped with green, a native of the Carpathian mountains. All the species will grow to the height of three or four feet in the open air; but they may be dwarfed and rendered bushy by growing them in very small pots, and frequently shifting them into others, gradually getting larger, till they are about to flower, when the pots may be set out on a lawn or terrace, or plunged into the open ground.

ACONITE, WINTER.—See ERA'NTHIS.

ACTÆ'A.—*Ranunculàceæ.*—Little British and European plants with white flowers, and black berries, which are poisonous. The English name of the genus is Bane-berry; but the only British species is called Herb Christopher. It requires a shady situation, and a calcareous soil.

A'CYNOS.—*Labiàtæ.*—A perennial plant somewhat resembling thyme. *A. vulgàris*, the only ornamental species, is a native of Europe, not above six inches high, and of easy culture in any common soil.

ADAM'S NEEDLE.—See YU'CCA.

ADENOCARPUS.—See CYTISUS.

ADENO'PHORA. — *Campanulàceæ.* —Perennial plants with blue bell-shaped flowers, resembling the Campanulas. They require to be planted in rich but light soil, and are easily killed by much moisture. Natives of Siberia, *and propagated by division* of the root.

ADE'SMIA, Dec. Leguminòsæ.—Herbaceous plants and shrubs with yellow pea-like flowers, growing freely in the open air in any common soil.

ADIA'NTUM. — *Cryptogamia.* — Maiden-hair, a kind of fern.

ADLU'MIA. — *Fumariàceæ.*— A climbing biennial, with pinkish flowers like those of the fumitory. It is a native of North America, and will grow in any common soil. The seeds should be sown in autumn, and the young plants kept in pots in a greenhouse or frame, for planting out in spring. Thus treated, and trained to a trellis or wire frame, they will begin to flower in June, and will continue producing abundance of flowers during the whole summer.

ADO'NIS.—*Ranunculàceæ.*—Herbaceous plants with showy flowers, natives of Europe, of easy culture in any common soil. The most ornamental species are *A. vernàlis*, the spring-flowering Adonis, a perennial with bright yellow flowers, which is quite hardy, and is easily increased by division of the root; and *A. autumnàlis*, the common annual *Flos Adònis*, or Pheasant's Eye, with dark crimson flowers. All the species will grow in any common garden soil; and the annual kinds should be sown in autumn, as they will stand the winter in the open air,—or in February or March, as they are a long time before they come into flower. The seeds will keep good several years.

ÆCHME'A—*Bromeliàceæ.*— Parasitical stove-plants, natives of the West Indies, with leaves like the pine-apple, but producing their flowers (which are red and green, with bright scarlet bracteas,) in spikes. The fruit is a bright blue berry, and very ornamental.

ÆCI'DIUM.—A kind of fungus which is sometimes found on the leaves of plants belonging to the genus Pyrus.

AERIDE'S.—*Orchidàceæ.* —Stove ephiphytes, natives of the East

Indies, with whitish flowers that have the odour of the tuberose. They should be grown on moss, and suspended from the rafters of a very damp hothouse. They are very difficult to propagate.

Æschyna'nthus, Jack.; **Incarvi'llea**, Rox.—*Cyrtandraceæ.*—Stove parasitical shrubs, growing four or five feet high. Natives of India, where they are found in moist, shady woods, hanging from tree to tree, and producing large bunches of their showy orange scarlet flowers. In England they should be grown in moss, or in vegetable mould and sand, and they should be allowed abundance of heat and moisture. They are very difficult to propagate.

Æ'sculus.—*Æsculàceæ.*—Most of the horse chestnuts are too large trees to be admitted into a work like the present; but the red-flowered horse-chestnut (*Æ. rubicúnda*) and its varieties, are seldom above twelve or fifteen feet high, and they are therefore very suitable for a shrubbery. The most beautiful variety is *Whitley's Scarlet*. These trees should be grown in a sheltered situation, or they will not flower well. For the yellow-flowered horse-chestnut, see **Pavia**.

African Lily.—See **Agapa'nthus**.

African Marigold.—See **Tage'tes**.

Agapa'nthus. — *Hemerocallidaceæ.*—The Blue African Lily, *A. umbellátus*, is a noble plant, with a bulbous root, somewhat resembling that of a leek; and it retains its leaves all the winter. There is a variety with striped leaves. *A. álbidus* has white flowers, but it does not differ from the common kind in any other respect. The African lilies all require a loamy soil, mixed with very rotten manure from an old hot-bed, so as to make it rich; and they should be fully exposed to the light. They should also have plenty of water when they are in a growing state; and they should be shifted repeatedly into larger and larger pots, each only a little larger than the preceding one, taking off the offsets every time, if any should be found, till the flower-buds are formed. The plants are always very large before they flower; and when the flower-buds form, they should be in a large pot, so that the roots may have plenty of room; and they should be abundantly supplied with water, taking care, however, not to let any remain in a stagnant state about the roots. Thus treated, and kept in a greenhouse, or living-room, or under a veranda, this plant will frequently send up a flower-stalk above three feet high, crowned with twenty or thirty heads of flowers, which will come into blossom in succession. When in flower, it may be placed in the open air, and forms a noble ornament to an architectural terrace, or a fine object on a lawn. If the Agapanthus is wanted to flower, when of a comparatively small size, it should not be so often shifted; and when it is, the pots need not be so nearly of a size. Once shifting in spring will, indeed, be enough; and if the roots are so large as to require a pot of inconvenient size (for the roots must have plenty of room), the bulb may be divided, and the strongest of the fibrous roots cut off without injuring the plant, or preventing it from flowering.

Agaric.—Fungi, of the mushroom kind, but generally poisonous.

Agathosma.—See **Diosma**, from which the plants composing the genus Agathosma have been separated.

Agave'.—*Bromeliaceæ.*—Succulent plants from South America, of which one species, the American Aloe, *A. Americàna*, and a variegated-leaved variety of it, are old inhabitants of British gardens; having been formerly kept in tubs in the orangery or in some other house during winter, and set out during summer. The large leaves of the Agavè render it by no means adapted for a small greenhouse; but as it only requires to be protected from frost, it may be kept during the winter in a shed where there is very little light, and very seldom watered till summer, when it may be set out on a lawn or terrace; and this mode of treatment may be applied to all succulent plants that are dormant during our winters. The American Aloe requires a rich loamy soil, and is increased by suckers. It was formerly supposed that it produced its candelabra-like blossoms only once in a hundred years; but this is a vulgar error, as it sometimes produces its flowers, in hot countries, in ten years, the period varying to twenty, fifty, or even seventy years, according to the climate, and the care bestowed on the plant by the gardener. The flower stem is frequently forty feet high, and the plant dies as soon as it has done flowering. The aloe is a native of Mexico, and the other tropical parts of America; but it has been almost naturalised in the south of Europe. In its native countries, a strong spirit is distilled from its sap, the fibres of its leaves are used for thread, and the feculent matter contained in its stem for soap.

AGERATUM.—*Compósitæ.*—Mexican annuals, with curious heads of small pale blue flowers. The seeds should be sown in a warm border in a light soil in April or May.

AGROSTEMMA.—The Rose Campion. See LYCHNIS.

AIR PLANTS.—See EPIPHYTES.

AITONIA. —*Meliaceæ.*— A Cape shrub, growing about three feet high, in a mixture of sandy loam and peat. The flowers are pink, and something like those of a campanula in shape; but the plant is most ornamental in its capsules, which are of a fine pink colour, and of a very curious shape. It is propagated by cuttings struck in sand; but if they are covered with a bell-glass, it should be taken off very frequently and wiped, as they are very apt to damp off.

AJAX.—One of the genera formed by Mr. Haworth, out of Narcissus, but not generally adopted by botanists.

AJUGA.—*Labiatæ.* — The Bugle. Well known plants generally with dark blue flowers, always growing in dry soil, and increased by division of the roots. ***A. chamæpitys***, the ground-pine, has yellow flowers.

ALATERNUS. See RHAMNUS.

ALBUCA.—*Asphodeleæ.* — Pretty Cape bulbs, with white flowers resembling the star of Bethlehem. For culture, see ORNITHAGALUM.

ALCHEMILLA.—*Rosaceæ.*—Lady's Mantle. Hardy herbaceous plants, chiefly natives of the middle of Europe, of the easiest culture. The most ornamental species is ***A. alpina***, which seldom exceeds half a foot in height, with leaves of a deep green above, of a silky whiteness underneath, and with greenish yellow flowers. It is admirably adapted for rockwork, or growing in pots.

ALETRIS.—*Hemerocallidaceæ.*— Colic root. A little queer-looking perennial, with white flowers, from North America, about half a foot high, and requiring peat soil, and a shady situation. It is propagated by offsets or seeds.

ALEXANDRIAN LAUREL. See RUSCUS.

ALKEKENGI. See NICANDRA.

ALISMA. See LIMNOCHARIS.

ALKANET. See NONEA.

ALLAMANDA. — *Apocynaceæ.* — Climbing stove shrubs, with splendid yellow convolvulus-shaped flowers. ***A. cathartica***, a native of Guiana, is the most common species. They require a light rich soil, kept frequently watered; and they are increased by cuttings. Where a conservatory adjoins an orchideous house, or stove, the Allamanda and other splendid stove-climbers may be planted in the hothouse, and trained through a hole in the back wall into the conservatory, in the cool air of which the flowers will be more brilliant, and more agreeably seen, than in the damp hot air necessary for the roots. This plan was suggested, and has been acted upon by the Hon. and Rev. William Herbert at Spofforth, and by Mr. Beaton, the very intelligent gardener of T. Harris, Esq., at Kingsbury. There is no doubt, indeed, that the idea might be carried farther; and by plunging the pots in a hotbed, or pit heated by hot water, that the Allamanda, the splendid Ipomæa Horsfallii, the stove Passion flowers, particularly the Passiflora Kermisinii, and P. Loudoni, the Petræas, and many others, might be trained over trellis-work, and verandas, in the open air, so as to cover them with their flowers. See BOTTOM HEAT.

ALLIUM. — *Asphodeleæ.* — The garlic and onion tribe, of which there are above a hundred and fifty species in cultivation, natives of Europe and America, some few of which are considered ornamental, and one, *A. odòrum*, is sweet-scented. Among the ornamental species are *A. Mòly*, with yellow flowers; *A. descéndens*, with dark purple flowers; *A. incarnàtum*, with red flowers; and *A. Cowani*, *A. Chamæmòly*, and *A. neapolitànum*, with white flowers. All the species thrive in any common soil, and are increased abundantly by offsets from the bulbs. In a garden devoted exclusively to bulbs, the Alliums form a large and important group, from the great variety of their foliage, height, and time of flowering, and the different colours of the flowers; but they differ from almost all other ornamental plants, as they do not admit of being gathered, and put into nosegays, on account of their unpleasant smell.

ALLSPICE-TREE. See CALYCANTHUS.

ALMOND. See AMYGDALUS.

ALOE. — *Hemerocallidaceæ.* — The name of aloe is so frequently applied in conversation to the American aloe, or agavè, that many persons are not aware that the true aloe is not only quite a different genus, but belongs to a different natural order; the American aloe being one of the pine-apple tribe, and the true aloe one of the day-lily tribe. The qualities of the two tribes are also essentially different; the American aloe abounds in starchy nourishing matter, while every part of the true aloe is purgative. The true aloe also flowers every year, and the flowers are tube-shaped, and produced on a spike; while each plant of the American aloe flowers but once, sending up an enormous flower stem, with candelabra-like branches and cup-shaped flowers. The true aloes are succulent plants, natives of the Cape of Good Hope; and they grow best in this country in green-houses, or rooms, the pots being well drained, and the soil composed of a sandy loam, mixed with a little lime rubbish or gravel. To this, when the plants are wanted to attain a large size, may be added a little leaf mould. When grown in rooms, the poor soil is, however, preferable, as it keeps the plants of a smaller and more manageable size, and makes them less easily affected by changes of the temperature, and of heat and dryness. The colours of the flowers will also be richer when the plants are grown in poor soil. The drug called aloes is made principally from the pulp of the fleshy leaf of the Aloe Soccotrina, the flowers of which are red, tipped with green; but it is also made from several other species. A. vulgaris, sometimes called A. barbadensis, has orange-yellow flowers; and the Partridge-breast Aloe, A. variegata, has variegated leaves. All the kinds should be frequently watered when they are in a growing state and about to flower; but the water that runs through the mould in the pot, should always be poured directly out of the saucer; as if water be allowed to remain in a stagnant state about the roots, the leaves will rot and drop off. It is to prevent water lodging round the crown of the plant, which would produce the same effect, that gravel or lime rubbish should always be mixed with the soil. When the plants have done flowering, water should be given to them very sparingly, not oftener than once a month; and they should be kept in a dry, warm situation, where they will have plenty of light; as in this respect also they differ from the Agave, which may be kept during the winter almost in darkness. The Aloe is generally propagated by offsets or suckers, but in some instances they may be increased by stripping off a leaf, letting it dry for a day or two, and afterwards planting it, quite shallow, in a pot of sandy soil, and giving it very little water. In the course of a few months, one or several buds will be found formed at the base of the leaf, and roots being thrown down from the same point, a new plant will be produced.

Alonsoa. — *Scrophularineæ.* — The Mask flower. The species are low under-shrubs, or herbaceous plants, natives of Peru; and two of them, ***A. incisifólia***, R. et P., and ***A. lineàris***, H. K., formerly known as Celsias, afterwards as Hemimeris urticifolia, &c., are very ornamental either in the greenhouse, or grown as annuals in the open border during summer. They thrive well in any light rich soil, and are readily increased by seeds or cuttings. They are very desirable for flower-gardens, on account of the brilliant scarlet of their flowers; and *where there is no greenhouse the plants should be raised from seeds, sown on a hot-bed in February*, or struck from cuttings early in spring, and brought forward in a frame or pit, and turned out into the open air in May. When kept in a greenhouse they should always be set out in the open air when the other plants are fumigated, as they are easily killed by tobacco smoke, or any other strongly smelling vapour.

Aloysia. — *Verbenàceæ.* — The only species of this genus known in Britain is ***A. citriodòra***, a native of South America, formerly called ***Verbena triphylla***, or the lemon-scented verbena. It is a half hardy shrub, with panicles of small pinkish white flowers, and very fragrant leaves, which fall off in the winter. It requires a rich but light soil, well drained; and when grown in pots, it should never have water kept in the saucer. In winter, after its leaves have dropped, it should be kept nearly dry till the buds begin to swell, when it should be watered frequently and abundantly, but the water should never be suffered to remain in a stagnant state about the roots. It is easily propagated by cuttings, and only requires to be protected from severe frosts.

Alpine Plants. — Dwarf plants, natives of high mountains, and usually with bright coloured flowers; generally employed for ornamenting rock work, and which, as they are covered with snow during winter in their native countries, require protection.

Alpi′nia.—*Scitamineæ.*—A genus of reed-like plants, natives of the East Indies and South America, with large and showy white or pink flowers, of which one or two species merit a place in select collections of stove plants. ***A. nùtans*** is one of the most common, and when grown in rich sandy soil, in a moist heat, with plenty of room, it will flower freely. Like most of the other Scitamineous genera, there is a considerable degree of sameness in all the species, both in flowers and fruit, and therefore one kind is enough for a small collection.

ALSINE'.—The ornamental kinds are now called ARENARIA.—The common Alsine is chickweed.

ALSTONIA. — *Apocyneæ.* — Stove shrubs, natives of the East Indies, with jasmine-like flowers.

ALSTRŒME'RIA.—*Amaryllidaceæ.* —This is a genus of tuberous-rooted plants, with beautiful flowers, natives of South America, and capable of being grown to a high degree of perfection in British gardens, in the stove, greenhouse, or open air, according to the species. The soil which suits all the Alstrœmerias is a mixture of sandy loam and leaf mould, or well-rotted dung. Of all the stove species, *A. lígtu*, with white and scarlet flowers, is the most difficult to flower; but by giving it abundance of water during summer, and a strong heat in December, it will flower in February; and one plant will scent a whole house with fragrance like that of mignonette. After flowering the plants ought to be allowed to rest for three months, during which time very little water ought to be given to them. After this they should be repotted, and encouraged to grow, by giving them plenty of water, &c. *A. édulis*, Jus. is another stove species, which climbs to the height of ten or twelve feet, and, like all other climbers, thrives best when turned out into the open border. It may, however, be grown in a pot, commencing with one of small size, and shifting it several times, till it is at last put into a pot of eight or nine inches in diameter, when a frame of wire, three feet or four feet high, may be fixed to the pot, and the stems trained over it. These species will live and flower in a greenhouse, but not so freely as in a stove. The *treatment of the greenhouse species of Alstrœmeria*, consists in setting the plants to rest by withholding water after they have done flowering, which is generally about the end of July; fresh potting them about October or November, and giving them plenty of heat and water during April and May, the time when their growth is most rapid, and when, from the brittleness of their shoots, and the tenderness of their leaves, they require to be sheltered or shaded from the sun and wind. The climbing species, *A. acutifólia*, L. et O.; *A. hirtella*, Kunth, and *A. salsilla*, L., succeed best both in flowering and ripening seeds, when planted in the border of a conservatory, or in the front of a stove or greenhouse, close under the wall, with protection during severe weather. Several of the species from Mexico, Chili, and Peru, will live in the open air in similar situations; and the greater part of these will grow luxuriantly, and in fine seasons will flower freely, producing flowers of a much darker colour than those which have been grown under glass, and they will even ripen seeds. Those species which have been found to succeed best in the open air, are *A. pulchélla*, Sims, *A. pelegrìna*, L., and *A. versícolor*, R. et P. All the species are readily increased by parting the roots or by seeds.

ALTAGONA.—See CARAGANA.

ALTHÆA.—*Malvàceæ.*—The Hollyhock. Strong herbaceous plants, natives of the middle and south of Europe, and also of India and China, of which one species, *A. ròsea*, the common hollyhock, is one of our most splendid ornamental biennials. It grows to the height of from five to eight feet, and there are varieties of almost every colour, including white, and purple so deep as to be almost black. The flowers being large, and the stems erect, the plants have the best effect when grown in rows at the back of a border; or when one or two are planted along with round-headed plants—for example, with the French honeysuckle, the annual chrysanthemums, or any of the sweet peas, if trained to form a bush: but the Hollyhock produces its best effect when each plant rises by itself from a circular patch in a lawn. An avenue of Hollyhocks, without any other flowering plants, is also very grand and ornamental, especially if the background on each side of the avenue be a hedge of laurel or some other evergreen shrub. The fine effect of the Hollyhock with such a background, is no where better seen than at Dropmore. The seeds of Hollyhock, which is a biennial, should be sown in March; in April, when the plants are up, they should be thinned out, and then suffered to remain till September, when they should be transplanted to the place where they are to flower. As the Hollyhock requires a rich and strong soil, it will be advisable, if the general soil of the garden be not of that nature, to dig a pit two feet in diameter, and two feet deep, which should be filled with equal parts of good strong loam, and thoroughly rotten dung, chopped up and well mixed together with the spade. When the pit is filled, the earth should be allowed a few days to settle, and then filled up to the general level of the garden; after which the young Hollyhocks should be planted in it, singly, if the plants be very strong, and three together if they should be weak. When the flower-stem appears, it should be tied to a stake, if not strong enough to support itself.

Althæa Frutex.—See Hibiscus.

Alyssum. — *Cruciferæ.* — Madwort. Herbaceous plants, both perennial and annual, of low growth, and with showy flowers; chiefly natives of Europe. *A. saxátile*, which grows about a foot high, and which produces its yellow flowers in April, is one of the most ornamental of the perennial species, and well adapted either for rock-work or pots; as is *A. deltoideum*, L., *Aubriètia deltoidea*, Dec., which has purple flowers. The Sweet Alyssum, *A. halimifolium*, or *A. calycìnum*, now called *Koniga maritima*, which has white flowers, is well adapted for edgings to beds. All the species are of the easiest culture in common soil, if not kept too moist, but they thrive best in sand or gravel. The perennial species are readily increased by cuttings planted under a hand-glass, and the annual ones by seeds. Though the perennial species are very hardy, yet as they are in truth not true perennials, but plants with half-shrubby or suffruticose stems, they are apt to be injured by either severe winters or very hot summers, (for, though injured by much wet, the roots will soon wither if they are kept too dry), and consequently they require to be renewed every three or four years. (See Suffruticose Plants.)

Amarantus. — *Amaranthaceæ.* —An extensive genus of annuals, chiefly natives of warm climates, most of which will flower in the open air in this country, if sown in February on a hot bed, and planted out in May. The most common species are *A. hypochondrìacus*, the prince's feather; and *A. caudàtus*, love-lies-bleeding, both old inhabitants of British gardens, and of the easiest culture. *A. tricòlor* is a greenhouse annual, chiefly remarkable for the red and white blotches in the centre of its leaves. The leaves of all the species may be used as spinach, and they are so employed in China.

Amaranth.—The amaranth of the poets is generally supposed to be the globe amaranth.—See Gomphrena.

Amaryllis. — *Amaryllidáceæ.*— Bulbous plants, chiefly natives of the Cape of Good Hope and South

America; but which have been increased in number tenfold by hybrids and varieties raised in England, principally by the Hon. and Rev. W. Herbert, and the late Mr. Sweet. All the kinds are eminently ornamental, and they are all of easy culture; the great secret being to give them alternately a season of excitement and a season of repose. To do this effectually, the plants should be abundantly supplied with water and heat, and placed near the glass when they are coming into flower, and water should be withheld from them by degrees, when they have done flowering, till they have entirely ceased growing; when they should be kept quite dry, and in a state of rest. When in this state they may be placed in any obscure part of a stove or greenhouse where it is dry, and of a temperature not under forty or fifty degrees. If kept in such a situation during winter, some kinds may be turned out into a warmer border in spring, where they will flower; and if the season be fine they will renew their bulbs in time to be taken up before the approach of frost. The chief value of these plants, however, is to produce flowers in the winter season, which they readily do if they are kept dry and dormant during the latter part of the summer and autumn. Indeed, by having a large stock of these bulbs, a regular succession of flowers might be procured during every month in the year. When the dormant bulbs are intended to be thrown into flower, they should be fresh potted in sandy loam and leaf mould, and put into a stove or hotbed, the heat beginning at fifty degrees, and ascending to sixty or seventy degrees; and when the leaves appear, they should be supplied abundantly with water. Where seeds are wanted the watering must be continued, though somewhat less abundantly, after the flowers have faded, till the seeds are ripe; and when these are gathered, they ought to be sown immediately in light sandy loam, and placed in a frame, or near the glass, in a moist part of the hothouse. If the young plants are potted off as soon as they are an inch or two in height, and shifted frequently in the course of the growing season, they will attain a flowering size in from fifteen to twenty months. The pots in which these and all other bulbs are grown, ought to be thoroughly drained by a handful or more of pot-sherds (broken pots) laid in the bottom of each pot, and covered with turfy peat; and the mould used should also be turfy, in order the more freely to admit the passage of water.

Amberboa, *Dec.*— *Compositæ.* — Sweet Sultan. Well-known half-hardy annuals, natives of Persia, the seeds of which may be sown in the open border in April or May.

Ambrosia. —*Compositæ.*—Weedy plants of no beauty, with spikes of very small greenish flowers, and cut leaves, which, when bruised, have rather an agreeable smell. Though among the annuals in some of the old seed catalogues, they are now scarcely ever grown except in botanic gardens.

Amelanchier.—*Rosaceæ.*—Deciduous shrubs or low trees, with showy white flowers, which appear in April. *A. vulgàris* and *A. botryàpium*, the snowy Mespilus, are very desirable species for shrubberies. They are commonly propagated by grafting on the hawthorn, and they will grow in any soil, and require very little pruning. Like other rosaceous shrubs, however, they are very liable to have their foliage injured by caterpillars.

Amellus, *Dec.* —*Compositæ.* — There are only two species, one a greenhouse perennial, and the other an aster-like annual. *Amellus annuus*, which was formerly called *Kaulfus-*

sia amelloides, and which is a very pretty little plant, is remarkable from the curious rolling up of its petals. Both species are natives of the Cape, and as they require a light soil, will not grow in clay without the addition of sand.

American Aloe.—See **Agave.**

American Convolvulus.—See **Calystegia.**

American Cowslip.—See **Dodecatheon.**

Amethystea.—*Labiatæ.*—An annual plant with blue flowers; a native of Siberia, of easy culture in any soil or situation, except that it will not bear transplanting, unless when it is in the seed leaf.

Ammo'bium.—*Compositæ.*—A kind of everlasting flower, with a yellow disk and white ray like a daisy. A native of New South Wales, where it was found growing in pure sand. It is generally grown from seeds as an annual; but by taking cuttings from it, it may be kept two or three years.

Amorpha.—*Leguminosæ.*—Deciduous shrubs, with pinnate leaves, from North America, varying from two to six feet in height, with showy dark blue and orange flowers in terminal spikes. *A. Lewisii* has flowers of gold and purple of great beauty when examined closely. All the species are of comparatively short duration; their wood being soft, with a large proportion of pith, and their branches very liable to be broken off by high winds; in other respects they are of easy culture in sandy soil, and they are readily propagated by cuttings or layers. Indigo is made from the pulpy part of the leaves of *A. indigófera*, an East Indian species.

Ampelopsis, *Mx.*—*Vitaceæ.*—*A. hederacea*, is well known by its English names of Virginian creeper, and five-leaved ivy. Its flowers have no beauty, but it is worth cultivating as an ornamental plant, from the brilliant scarlet which its leaves assume in autumn; and which look particularly well at that season, when intermingled with those of the common ivy, from the fine contrast they afford. The plant is of very rapid growth in any common soil, and it is propagated by layers, or cuttings.

Amphicome', *Royle.*—*Bignoniaceæ.*—A very beautiful Nepal perennial, with tube-shaped pink flowers. It appears quite hardy, but as it is necessary to give it a period of complete rest, during which it should have scarcely any water, it is safer to keep it in a greenhouse, at least during winter, allowing it abundance of light. It may be propagated by either seeds or cuttings, though the first are sometimes two years before they vegetate, and the cuttings are very difficult to strike. The soil it is grown in should be loam, mixed with a little heath mould, or sand.

Amygdalus.—*Rosaceæ.* — There are two species of Almonds which are highly ornamental, on account of their flowers. *A. nana*, which does not grow above two feet high, and produces its red flowers in March; and *A. commùnis*, which forms a small deciduous tree, profusely covered with flowers, in March and April, before it expands its leaves. There are several varieties of both species, but the only one which is worth notice, is the large flowered Almond, *A. c. macrocarpa*, which has much larger flowers than the common kind, though they are much paler. The dwarf almond is propagated by suckers, and the other species and varieties by grafting on the common plum. What is generally known in gardens as the double dwarf almond, is now called by botanists, *Cerasus*, or *Prunus japonica.* Whenever the tree Almond is planted for its flowers, care should be taken to let it have a back ground of evergreens; as otherwise, from the flowers being produced before the leaves, half their beauty will be lost from the cold and naked appearance of the tree. All the Almonds will grow and blossom freely in the smoke of London.

Anagallis.—*Primulaceæ.*—The Pimpernel. Trailing herbaceous plants, natives of the middle and south of Europe. The common wild pimpernel, *A. arvensis*, is red, but the exotic species vary to several shades of purple, lilac, and blue. The finest species is *A. Monelli*, which requires the protection of the greenhouse during winter, but which forms a beautiful close covering for a flower-bed in the open garden in summer, producing its fine mazarine blue flowers from May to September. It is easily propagated by cuttings which root immediately in sand under a hand-glass, and it will thrive in any light soil.

Anchusa.—*Boragineæ.*—Coarse growing plants, annuals and perennials, natives of the south of Europe, and in part of Asia and Africa, remarkable for their intensely blue flowers, in some cases varied with red and white. The finest species is *A. paniculata*, or *italica*, the Italian Bugloss, which is common in gardens. The flowers are in erect leafy spikes, and are of a brilliant blue, with their backs and buds of a reddish purple, and the plant continues flowering from June to September. The most ornamental of the annual species are now included in the genus Nonea.

Andrachne. See Arbutus.

Andro'meda.—*Ericeæ.*—Low deciduous and evergreen heath-like shrubs, chiefly natives of North America, and some of which are very ornamental. The species which were comprised in the genus Andromeda of Linnæus, have been divided by Professor Don into seven genera; viz., Cassiope, Cassandra, Zenobia, Lyonia, Leucothoe, Pieris, and Agonista; but the plants are still known by their old names in most of the nurseries. The species left in Andromeda by Professor Don, are *A. polifolia*, and *A. rosmarinifolia.* The handsomest species are *A. speciosa* (Zenobia), *A. racemosa* (Lyonia), *A. Catesbeii* (Leucothoe spinulosa), and *A. floribunda* (Leucothoe). All the species are generally grown in heath mould, or peat, but they will also thrive in very fine sandy loam. In whatever soil they may be grown, the roots should never be suffered to become quite dry; as like those of all the hair-rooted plants, when once withered, they cannot be restored; and the plant has seldom vigour enough to send out a sufficient quantity of new ones. All the kinds are propagated by layers.

Androsa'ce.—*Primulaceæ.*—Little insignificant plants, not worth growing except for rockwork; and only suited for that purpose, from their feeble habit of growth, which prevents them from spreading fast.

Androsæmum.—*Hypericinaceæ.*—A handsome evergreen British plant, with showy yellow flowers; very useful in covering the ground in shrubberies. It prefers a moist, shady situation, and is uninjured by the drip of trees. The English name of this plant is Tutsan.

Anemone.—*Ranunculaceæ.*—All the plants belonging to this genus are beautiful and well deserving of cultivation; from the little white wood Anemone (*A. nemoralis*), to the largest Dutch varieties of *A. coronaria*, which have been sometimes known to be six inches in diameter. The wild anemones, that is those found in the woods, and the Pasque-flower (*A. Pulsatilla*, or *P. vulgaris*), require but little care in their culture; but the garden varieties of *A. hortensis*, and *A. coronaria*, will need all the attention usually bestowed on a florist's flower. Of the other kinds, *A. palmata*, with bright yellow flowers, is best deserving of cultivation. The hepatica was once called *Anemone hepatica*, though this name has been long changed to *Hepatica triloba*. The florists' anemones spring from two species: the garland or Poppy Anemone, *A. coronaria*, with the outer petals, or rather sepals, rounded; and the Star Anemone, *A. hortensis*, or *stellata*, with them pointed. To these may perhaps be added a third, *A. pavonina*, resembling the last. The tubers of these fine kinds of anemones, and their hybrids and varieties, are sold in the seed-shops by the hundred. They should be planted in October, in beds prepared for their reception; and where expense is not an object, these beds should be dug out to the depth of about a foot. In the bottom of the pit thus formed, should be spread a layer of rotten cow-dung, six or eight inches thick; and on this, fresh loamy soil, so as to raise the bed three or four inches above the level of the walks. The surface of the bed is then raked smooth, and drills or furrows made in it about five inches apart, and two inches deep. A little sand should be strewed along these drills, and the anemone roots placed in them three or four inches apart. Care must be taken, in planting, to let the tubers have the side which contains the bud uppermost; and it sometimes requires rather a close examination to discover which side this is, particularly if the dry fibrous roots have been rubbed off, as the bud is not very conspicuous. All the pieces accidentally broken off should be preserved, as they will all grow, and form fresh tubers. The bed should be covered with bast mats stretched over hoops, or bundles of straw tied together, when danger is apprehended from frost; but this covering should be so contrived as to be easily removed when necessary, as the tubers are very liable to be injured, and even to become mouldy, by damp. When the plants begin to grow, they should be frequently watered with rain water, so as never to allow the fibrous roots to wither from drought; and when the plants have done flowering, the mats on hoops should be again stretched over the bed, and the plants kept quite dry, till their leaves be brown and wither, which will generally be in about a month after they have done flowering. The tubers should then be taken up, and kept dry, till the return of the proper season for planting. When seedling anemones are to be raised, the seed should be divested of its pappus, by rubbing it between the hands, or through a sieve, and sown in pots or boxes in August; the young tubers should be taken up when the leaves wither the following summer, and replanted in autumn, when they will flower the following spring.

Angelica-tree. See **Aralia.**

Angelonia.—*Scrophularineæ.*—An evergreen perennial, with very beautiful blue flowers, a native of South America. It should be kept in a cool airy part of the stove, or in a greenhouse; and it should be allowed a season of rest, during which it should have scarcely any water. The soil should be a very sandy loam, mixed with peat earth, and it may be propagated, though with difficulty, by cuttings, struck in pure sand.

Anigozanthos. — *Hæmodoraceæ.* —Evergreen herbaceous plants from New Holland, with deep crimson and green flowers, one of which, *A. Manglesii*, well deserves a place in every greenhouse. It should have abundance of light and air, and grows freely in loam and peat, kept moist; it is readily increased by division, or by seeds, which it has ripened in this country.

Annuals.—Plants which live only one summer; and which, with reference to their culture in British gardens, are either tender, half-hardy, or hardy. Tender annuals are kept during the whole period of their growth under glass; half-hardy annuals are raised under glass, and afterwards transplanted into the open garden; and hardy annuals are sown in the open garden.

Tender Annuals are sown in February or March, in pots of light rich earth, and placed in a hotbed; and as soon as the plants are come up, they are transplanted into pots of the very smallest size, one in each pot; which is called pricking them out. These small pots are again set in the hotbed as near the glass as possible, and slightly shaded during sunshine. In a week or two, when the roots have made their appearance on the outside of the ball of earth, which is known by turning the plant out of the pot, to examine the ball, and replacing it, the plants are shifted into pots one size larger; and this shifting is continued from time to time, always into pots, only a little larger than those the plants were taken out of; till at last the plants are in pots six, eight, or nine inches in diameter, according to their nature, and the size to which it is wished to grow them. In all the shiftings, light rich mould must be used to fill up the pots, and sufficient drainage secured, by placing potsherds in the bottom of each pot. In general, the more frequently the plant is shifted, the larger and more bushy it will become before it flowers; but when once flower-buds have made their appearance, no farther advantage can be gained from shifting, the growth of the plant being then mature. Some persons water tender annuals with liquid manure, which is found to answer in the case of balsams, coxcombs, and other strong growing plants, but to injure more tender growing kinds. The extraordinary size that balsams and coxcombs may be brought to by repeatedly shifting them in this manner, is not only gratifying in itself, but interesting and instructive, as showing the effect of art on plants. The balsam in a wild state in the East Indies, is seldom seen above a foot in height, with a stem half an inch in diameter; but in British hothouses it has been grown to the height of five feet, with a stem as thick as a man's leg. We have omitted to observe, that during the whole process of shifting, the temperature in which the plants are kept should be from sixty to seventy or even eighty degrees during sunshine; and that they should be so abundantly supplied with water, that the air should be constantly charged with moisture: but when the plants begin to flower, they ought to be removed to a dry airy situation, and the temperature gradually lowered. The dry air, and the lowering of the temperature, will not only increase the intensity of the colours of the flowers and leaves, but will prolong the duration of the plant.

Half-hardy Annuals may be sown either in pots, or in a bed of earth, on a slight hotbed, in February or March; and after they have come up they may be pricked out into pots, or into another slight hotbed, where they may remain till the beginning of May, when they should be transplanted into the beds or borders in the open garden, where they are finally to remain. In most cases, however, it is not worth while to prick out the plants in a second hotbed; and sometimes they may be sown in pots, and thinned out to two or three plants in a pot; and when they have grown two or three inches high, the ball of earth, and the plants in it, may be turned out into the open border. This mode is well adapted for strong clay soils, because when plants from a hotbed are transplanted into such soils, they commonly receive a severe check; whereas when they are turned out with balls, provided the soil round them is settled by a good watering, they receive no check whatever. The soil in which half-hardy annuals are raised, should be light and rich, because it is only in such a soil that the tender seedlings will grow vigorously, and produce numerous fibrous roots, without which they would produce but little effect when turned out into the open garden. The more showy kinds of half-hardy annuals are the French and African Marigolds, Chinese and German Asters, Zinnias, the purple Jacobæa, and a number of others. Brompton, ten-weeks, and German stocks, though quite hardy, make better plants, and consequently flower more vigorously when so raised. There are few plants more truly ornamental than the different kinds of stock; and when these are raised under glass, pricked out into pots of the smallest size, and gradually shifted from pots of two inches to those of ten inches in diameter, they will make winter ornaments for greenhouses and dining-rooms, which for fine masses of colour are unequalled by any production of tropical climates. Brompton stocks, treated in this manner, have been known to attain the height of six feet, and to live and flower for three years.

HARDY ANNUALS are generally sown in the open garden, where they are finally to remain; or they may be sown in pots or seed-beds to transplant into their final situation, when they are two or three inches high. The latter mode is preferable with all the California annuals, which grow stronger and flower better when sown in autumn, and suffered to stand the winter in the open air, than when they are sown with the other annuals in spring. About an inch in thickness of very light soil should be laid on a hard surface of rock or gravel, in any obscure part of the garden, and in this the seeds should be sown the first week in September. In March or April, according to the season, when the flower-beds and borders have been dug over and prepared, the young seedlings should be taken up by spadefuls and laid over the bed, filling up all the interstices between the patches with earth, so as to make the surface even. Thus treated, the Nemophilas, the Leptosiphous, the Collinsias, the Lasthenias, and, in short, all the Californian annuals will be splendidly in flower in May and June.

When the seeds of annuals are sown, the ground should first be made firm by pressing it with the saucer of a flower-pot, or the back of the spade; the seeds should then be sprinkled thinly over the ground, and just covered with fine earth, which should be slightly pressed down over them. When they come up, if they appear too thick, they should be thinned out so as to leave each plant standing apart; the distance at which they are left from each other varying, of course, according to the strength and habit of growth of the plant. The plants of some kinds of annuals will bear transplanting after they have been taken up in thinning, but generally they are not worth the trouble of replanting. The seeds when sown are often destroyed by birds; but this may be prevented by turning a flower-pot over each patch till the seeds have germinated, taking care, however, to remove it as soon as the plants begin to grow, lest they should be drawn up by the shelter thus afforded, and become weak. Snails and slugs are dangerous enemies to young and tender annuals, and care should be taken to search for them early in the morning and late in the evening; or to destroy them by watering the ground with lime water, so weak as not to disfigure the plants.

Anona, L. — *Anonàceæ.* — The Custard Apple.—Stove shrubs and low trees, natives of the East and West Indies. The hardy species are now formed into a separate genus, under the name of Asimina; and one species, *A. triloba*, which has very curious flowers, is frequently found in gardens and shrubberies.

Anomathè̀ca.—*Iridaceæ.*—Cape bulbs, with red flowers, and rather curious capsules, which have the appearance of being frosted. The bulbs should be planted in April, when they will produce flowers in June, and continue flowering till September. They should be taken up in November, and kept in a dry place till the following April. *A. juncea* was formerly considered a Lapeyrousia.

A'nthemis. — *Compositæ.*—The Chamomile. — *A. Pyrethrum*, the Pellitory of Spain, is a pretty little perennial, with large white flowers, stained with lilac on the back. It is a suitable plant for rock-work, or boxes in a balcony, as it requires a warm dry situation. Miller raised this plant in rather a curious way in 1732, finding its seeds among some Malaga raisins to which they had adhered. The root was formerly considered a cure for the toothache. The Arabian chamomile, a pretty low-growing hardy annual, with yellow flowers, is now called *Cladanthus Arabicus.*

Antholyza. — *Iridacea.* — Cape bulbs with showy flowers. For their culture, see **Anomatheca.**

Anthyllis.—*Leguminosæ.*—Kidney vetch. Dwarf plants with pretty flowers; generally used for rock-work; which are quite hardy, &c.; will grow in any common soil.

Ants are very troublesome creatures in hothouses and greenhouses, and it is very difficult to get rid of them. As, however, it has been found that the liquor discharged by ants is very acid and acrid, the idea presented itself that alkalies would be disagreeable to them; and experience proves this so far to be the case, that a circle of chalk or lime laid round any plant, will effectually prevent the ants from touching it.

Antirrhinum.—*Scrophularìnæ.*—The Snapdragon. Annual and perennial plants, natives of the middle and south of Europe, and of which one species, *A. màjus*, the common snapdragon, is in almost every garden. There are many varieties of this species, the finest of which, *A. m. caryophylloïdes*, has the flowers striped like those of a flaked carnation. All the species of snapdragon grow in any soil that is tolerably dry, and they are readily increased by cuttings; for though they produce abundance of seeds, yet the varieties can only be perpetuated with certainty by the former mode of propagation. The beautiful carnation-like variety will, indeed, very seldom produce striped flowers two years in succession from the same root; and thus a person who has purchased a plant with beautifully striped flowers, will generally have the mortification the second year to find it produce nothing but flowers of the common snapdragon, unless he has taken the precaution to make cuttings from the young shoots of his plant, and has thrown the root away. As this plant in its wild state is very commonly found growing on the tops of old walls, it may be considered as one of the most ornamental plants for placing in such a situation. Many of the plants formerly called *Antirrhi-*

num, are now removed to the genus *Linària.*

Aphis.—The green fly or plant-louse is one of the most troublesome insects to the gardener, particularly on rose trees. These insects lay their first set of eggs (which are small and black) in autumn, near the axils of the buds. These eggs are hatched in February or March, but as only a few insects appear, they generally escape unnoticed, and, after twice casting their skins, arrive at their full growth in April. From this period to the end of summer, brood after brood is produced with almost inconceivable rapidity; and as these aphides are all born alive, they begin to devour the plants on which they appear immediately. The tenth generation usually appears about September, and these insects lay eggs for the first brood the following spring. The best way of preventing the attacks of these insects is washing the branches of the rose trees with soft soap and water in January or February; or, in short, any time before the buds begin to swell. When they have appeared, the best way to destroy them is to lay the infested branches on the hand, and gently to brush off the insects with a soft brush. Some gardeners employ tobacco water, but when this is used the shoots should only remain a few seconds in the tobacco water, and then be washed immediately in clean cold water, or they will become so blackened and withered that the remedy will be worse than the insects. Snuff and lime-water are liable to the same objections, as both greatly disfigure the plants.

Aquarium.—A pond, basin, or cistern of water, for the growth of water plants. In a pond in the open garden, the plants may either be grown in pots, plunged to the depth of one or two feet in the water, or they may be planted in the bottom of the pond. The former is generally the best mode, because the plants are by that means kept distinct, and th stronger cannot overpower the weaker. At the same time very strong ground plants, such as the white and yellow water-lilies, do not flower freely unless in the free soil, or in very large tubs. There are few greenhouse aquatics, but a number of stove plants, which require to be grown in water; such as the Indian Lotus, or *Nelumbium*, &c., and these are necessarily grown in pots of moderate size. The most suitable soil is a rich loam. The papyrus, though properly speaking it is a marsh plant, is generally grown in an aquarium. See Marsh Plants.

Aquilegia. — *Ranunculaceæ.* — The Columbine. Perennial herbaceous plants, growing from one to two feet high, of which several species are very ornamental; more especially the common columbine, *A. vulgaris*, and its varieties, *A. alpìna*, *A. canadénsis*, and *A. glandulòsa.* They grow in any common soil that is dry; and the species are increased by seeds which will keep a long time, and the varieties by division of the root.

Arabis.—*Cruciferæ.*—Wall-cress. Herbaceous plants, chiefly annuals and biennials, natives of Europe, many of which are remarkable for their early flowering. *A. alpina* has white and yellow flowers, which appear in March, and *A. álbida* flowers the greater part of the year, commencing in mild winters in January, and producing its large tufts of white blossoms till October. Some of the species and varieties, such as *A. verna*, *A. alpìna nàna*, and *A. bellidifòlia*, do not grow above three inches high, and are admirable plants for rockwork, or gardens of pots.

Aralia.—*Araliaceæ.*—Hardy suffruticose plants, and stove shrubs, with umbels of small white flowers. The commonest species is *A. spinosa*, useful in a shrubbery for its hardiness, and for its thriving in any poor gravelly soil. There is a new species, *A. japonica*, which is said to be very handsome.

Arbor vitæ.—See **Thuja.**

Arboretum.—A collection of trees and shrubs, containing only one or two plants of a kind, arranged together according to some system or method. The most common arrangement is that of the Natural System; but the plants in an arboretum may be placed together according to the countries of which they are natives; according to the soil in which they grow; or according to their sizes and habits, or time of leafing, or flowering. In all small villa residences an arboretum is the most effectual means of procuring a maximum of enjoyment in a minimum of space, as far as trees and shrubs are concerned. To render an arboretum useful and interesting, each tree and shrub should be named.

Arbours.—Seats or resting-places, forming terminations to walks, or fixed in retired parts of shrubberies or pleasure-grounds. In general, every straight walk ought to lead to some object of use, as well as of beauty; and an arbour is one of those in most common use. The structure being formed, climbing plants, ligneous or herbaceous, are planted all around it at the base of the trellis work, or frame, against which, as they climb up, they ought to be tied and trained, so as to spread over the whole arbour. Some of the best plants for this purpose are the different species of honeysuckle, roses, and clematis; and the laburnum, the periploca græca, the maurandias, the wistarias, eccremocarpus scabra, lophospermum, rhodochiton, the Virginian creeper, cobæa scandens, and ivy.

Arbutus. — *Ericaceæ.* — The Strawberry-tree. Well-known evergreen shrubs, of which *A. Unèdo rùbra* deserves to be mentioned for the beauty of its flowers; *A. canariensis*, a greenhouse species, has also very showy flowers; and *A. Andráchne*, which is the tenderest of the open air kinds, is remarkable for the looseness and redness of its bark. All the species are very ornamental, and of free growth; and they all thrive best in heath mould, or very sandy loam. They are propagated by layers or cuttings.

Arctotis.—*Compositæ.*—Undershrubs and herbaceous plants, natives of the Cape of Good Hope, and of which one species, *A. áspera*, has large yellow flowers, and is truly ornamental. It grows freely in loamy soil, and is increased by cuttings planted in sand under a hand-glass.

Ardisia.—*Myrsineæ.*—A genus of stove shrubs, of which *A. lentiginòsa* is very ornamental for its scarlet fruit. They all grow in loam and peat, and cuttings root freely in sand in a moist heat under a hand-glass. They may also be increased by cuttings of the root placed in heat.

Argemone. — *Papaveraceæ.* — Prickly-poppy. Highly ornamental hardy annuals and perennials from Mexico, with large flowers like those of the poppy, and of the easiest culture. The plants spreading widely, to look handsome require a good deal of room.

Aristolochia.—*Asarinæ.*— Birthwort. The aristolochias are mostly climbing plants, requiring the heat of a stove; but *A. Sipho*, *A. tomentosa*, and *A. Arkansa*, natives of North America, are hardy enough to endure the open air in Britain, without the slightest protection. They are all remarkable for the very singular shape of their flowers, and their disagreeable smell. They should be grown in sandy loam and peat; and they are propagated by cuttings.

Aristotelea.—*Homalineæ.*—*A. Macqui* is a handsome shrub, a native of North America, which is rather tender in the open ground.

Armeria. — *Plumbagineæ.* — Thrift. Hardy perennials, most of which are ornamental from their flowers; and one species, *A. vulgàris*, the common thrift, is the best flowering plant for edgings to beds and borders. (See Edgings.) It thrives in any soil not saturated with moisture, and is rapidly increased by division. *A. alpìna*, which produces its pink flowers from May to August, is a most desirable plant for pots, or rockwork.

Artemisa. — *Compositæ.* — This genus contains, among other plants, two well-known shrubs; the southernwood or old man, *Artemìsa Arbrotanum*, and the wormwood, *A. Absinthium*. They are both very hardy, and will grow in any common soil; and the southernwood is valuable for bearing want of air, and smoke, without injury. Few persons are, perhaps, aware, that the leaves of this plant, when held up against a strong light, appear full of transparent dots; these are the vesicles containing the fragrant oil that gives out the scent; and it is by breaking them, that rubbing the leaves between the fingers, makes them smell stronger.

Arum.—*Aroideæ.*—A genus of perennials, chiefly natives of warm climates, and of which a few species are hardy in British gardens. Of these, *A. dracunculus*, the dragon-arum, deserves a place in the flower-garden, for its large very remarkable flowers. The large and splendid plant, with arrow-shaped leaves and white flowers, commonly called the arum, belongs to a different genus, and was first called by botanists *Calla*, and afterwards *Richardia æthiòpica*. It is a native of the Cape of Good Hope, and St. Helena, where it grows in rich soil by the side of rivers. In England, it will not bear the winter in the open air, unless well protected and kept dry; and it is generally grown in pots. It is increased by offsets, which form on its thick fleshy roots in August or September. These should be potted in small pots, in soil composed of three parts of sandy loam, and one of leaf mould, or thoroughly rotten manure. The pots should be well drained, and the plants frequently watered, while they are in a growing state. About May or June, the leaves will begin to wither at their points; and when this is perceived, the supply of water should be lessened, till at last only enough is given just to keep the plant alive. During the time the leaves are dying off, the plant should have abundance of light; but when they are all withered, the plant should be removed to any shed or other place where it may enjoy complete repose for about a month. In October or November it should be repotted, and supplied with abundance of water, particularly if kept in a sitting-room, where there is a daily fire. It should indeed always stand in a saucer full of water (changing the water every day), as the plant will not flower if once suffered to become too dry while in a growing state; and as it has the extraordinary power of discharging the superabundant water from the points of its leaves, in drops. This quality renders it also suitable for culture as an aquatic plant; and thus treated, it will live in the open air all winter, and when the leaves die down, the water will keep the root from frost. The roots must be planted in the mud at the bottom of the pond, and a part should be chosen where the water is not more than three feet deep. This must be attended to; because, as the plant will not expand its flowers till its leaves rise above the surface, the stem would become weakened by being more elongated. The plant generally flowers in March or April; but by prolonging its season of repose, it may be made to flower in May or June.

Arundo.—*Gramineæ.*—*A. Dònax*, is a splendid bamboo-looking reed, growing, in rich soil kept moist, to the height of ten or twelve feet in the climate of London in one year; and producing a fine oriental appearance when standing singly on a lawn, or near water. There is a very beautiful variety with variegated leaves. The species is a native of Italy, and it is often used instead of bamboo for chairs, canes, &c.

Ascle'pias. — *Asclepiddeæ.* — Swallow-wort. North American herbaceous plants, for the greater part hardy in British gardens. The most ornamental species is *A. tuberosa*, which has fine orange-coloured flowers, and is somewhat difficult to cultivate. It thrives however in sandy peat, kept rather dry than otherwise, and seldom disturbed by removal; and it is increased by division. *A. amœna* has purple flowers, and thrives in a mixture of peat and loam. The finest hothouse species is a *A. currasavica*, which has scarlet flowers, and grows best in rich mould; and which is readily increased by cuttings, or by seeds, which it produces in abundance.

Ash Barberry.—See Mahonia.

Aspe'rula.— *Rubiaceæ.* —Woodruff. Hardy herbaceous plants, of which one species, *A. odorata*, the common woodruff, deserves culture for its sweet-scented white flowers, which, with the dried plant, have the scent of hay. It is well adapted for growing in pots, and for rockwork on a large scale; but as it increases rapidly by its creeping roots, it is by no means desirable for small rockwork.

Aspho'delus. —*Asphodeleæ.* — King's-spear, or king's-rod. Ornamental herbaceous plants, mostly quite hardy, of which *A. albus*, and *A. luteus*, are the most ornamental species. They are coarse-growing plants, and increase rapidly by suckers in any common soil.

Aster.—*Compositæ.* — The Michaelmas Daisy. Hardy herbaceous plants, mostly perennials. There are also a few Cape and New Holland shrubs. The herbaceous species are of great value, from their flowering late in autumn, and from their requiring very little care or labour in their culture. They grow in any soil, or situation, and spread rapidly by throwing up suckers, and sending out root stems. Among the handsomest perennial species are *A. alpinus*, *A. ericoides*, the common Michaelmas daisy. The China aster has been separated by botanists from the genus Aster; it was first placed in the genus Callistema, but it and its varieties, the German asters, &c., now form the new genus Callistephus, under which the culture of the plant is given. *Aster tenellus* is thus the only annual species left in the old genus, and it is a pretty little hardy plant; which may be sown in the open ground in March or April. Among the greenhouse species of Aster, *A. argophyllus*, sometimes called the musk-plant, is remarkable for its white leaves and strong scent; and *A. furticulòsus* has pretty blue flowers. These two last species are grown in sandy peat, or a mixture of loam and peat, and are readily propagated.

Astra'galus. — *Leguminosæ.* — The Milk Vetch. Vigorous-growing pea-flowered plants, of which several deserve culture, on account of their flowers. They grow in any common soil with a dry bottom, and are readily increased by seeds, or by division.

Atamasco Lily.—See **Zephyranthes.**

Atrage'ne'. — *Ranunculaceæ.* — This genus is nearly allied to Clematis. The species are suffruticose climbers, much admired for the beauty of their flowers, and very suitable for training against walls, or trellis-work, or for covering bowers. They all grow freely in any common garden soil, and they are readily increased by layers, or by cuttings of the growing wood planted in sand under a hand-glass. They also frequently ripen seeds which ought to be sown immediately, in which case they will come up the following spring; otherwise if kept some months before sowing, they will probably lie in the ground a year; all the species are beautiful, but ***A. austriaca***, with blue flowers, and ***A. sibirica***, with white flowers, are the most ornamental.

Aubrietia. — *Cruciferæ.* — A genus of pretty little plants, generally with purple flowers, not above three inches high, which flower in March, and are admirably adapted for pots, or miniature rockwork. They grow in any common soil, and are readily propagated by division. *A. deltoidea*, and *A. purpùrea*, are the most desirable species.

Aucuba.—*Loranthaceæ*, or *Cornàceæ.*—A hardy evergreen shrub, which, though a native of Japan, endures the severest winters in the climate of London. It is common in every garden, and it is often called the Japan, or spotted laurel. The leaves are leathery, and variegated; and the bark of the shoots is of a deep pea-green. It will grow in any soil, either in an open situation, or under the drip of trees; and it forms a compact bush, which never requires pruning. It is propagated by cuttings or layers. The Acuba in British gardens is supposed to be only the *female* plant, as though it has been introduced above fifty years, it has never ripened seeds, though it flowers every spring; and the species, of which our variegated plant is evidently only a variety, has never been introduced. Botanists also appear to have been much puzzled to know where to place it; as it was first considered to belong to Rhamnaceæ, with the buckthorns, then to Loranthaceæ, with the miseltoe; and now to Cornaceæ, with the dogwoods.

Auricula. See **Primula.**

Australian Shrubs have nearly all a strong tap root, which sends out very fine fibres; they all require a sandy loám, or peat, mixed with decayed leaves; and they should all be frequently watered, but the water never suffered to remain in a stagnant state round their roots. They are all easily killed by an excess of either stagnant moisture, or drought, as in the latter case the slender fibres of the roots wither, and are seldom, if ever, renewed; and the seeds of nearly all of them are very long before they vegetate, unless steeped for at least twenty-four hours in water, which should be hot when poured on them. All the Australian shrubs and trees are very tenacious of life; and when apparently killed, they will generally, if cut down, spring again from the root.

Azalea, *L.*—*Ericaceæ.*—Beautiful shrubs, natives of North America, and India; the former growing freely in the open air, but the latter requiring the protection of a greenhouse. They should be grown in peat earth, heath mould, or very sandy loam; and provided the ground they grow in is well drained, and they are never allowed to become too dry, they will thrive in almost any situation, though they prefer the shade; they may be transplanted at almost any age, or season, even when in flower, provided a ball of earth be kept round their roots; and as they hybridize freely, and ripen seed abundantly, innumerable varieties may be raised. They also bear both forcing and retarding extremely well. Several attempts have been made to naturalise them in this country; particularly at High Clerc, near Newbury, the seat of Lord Carnarvon. The kinds called the Ghent Azaleas, are hybrids and varieties raised in Belgium. Professor Don and some other botanists consider nearly all the Azaleas to belong to the Rhododendrons, and they have left only one miserable little trailing plant, a native of Scotland, *Azalea procumbens*, in the once splendid genus Azalea of Linnæus.

AZAROLE TREE.—See CRATÆGUS.

AZEDERACH.—See MELIA.

B.

BABIANA.—*Iridaceæ.*—A genus of Cape plants, with solid bulbs or corms, which are eaten by the Hottentots; and which, when roasted, are said to resemble chestnuts. The species have all showy flowers. For their culture see BULBS.

BAERIA.—*Compositæ.*—A hardy annual, with yellow flowers.

BALCONY GARDEN.—The most suitable plants for balconies are those of low growth; and as, from their exposed situation, they are liable to great and sudden changes, with regard to temperature, winds, and moisture, they ought to be naturally tolerably hardy. To prevent the soil in the pots from becoming over dried, from the pot being constantly exposed to the wind, one pot ought to be placed within another, with a little sand or moss between, and this sand or moss ought to be kept constantly moist. The pots may be set in saucers, provided a little gravel be placed in the bottom of each saucer, so as to allow the free escape of water from the hole in the bottom of the pot; for if this water stagnates in the pot, it soon swells the soil so as to close up the hole in the bottom, and to prevent the free escape of water; in which case the soil in the pot is sure to become sodden. When there is no gravel in the saucers, the plants should be well and frequently watered; but the water that runs through the earth in the pot into the saucers, should be poured out immediately and thrown away. A very good mode of growing plants in balconies is, to set the pots in wooden boxes or troughs, painted stone colour, with a little gravel at the bottom, for the pots to stand on, and with the interstices filled in with moss, which may also cover the rims and surface of the pots. Mignonette and trailing plants are best grown entirely in wooden boxes, without the intervention of pots.

BA'CCHARIS.--*Compositæ.*--Ploughman's Spikenard. Shrubs generally with white flowers, and natives of America, growing in any common garden soil.

BALM. See DRACOCE'PHALUM.

BALSAM. See BALSAMINA.

BALSAMINA. — *Balsaminaceæ.* — Tender and half hardy annuals, with splendid flowers, mostly natives of the East Indies. The common balsam (*B. hortensis*) is a well-known greenhouse plant of great beauty. To grow it in perfection, the seeds should be sown on a hot-bed, and when the plants come up they should be transplanted into very small pots, which should be plunged into the hot-bed, and well supplied with water. In about a week, the plants should be transferred to larger pots; and this operation should be repeated ten or twelve times, always removing the plants to pots only a little larger than those they were taken from. As soon as the flower buds begin to form, the plants should not be shifted any more, and the pots which contain them must no longer be placed in the hot-bed, but the plants must be gradually exposed to the open air. Many gardeners never plunge the pots after the plants are three or four inches high, and remove them from the hot-bed to the green-house as soon as possible. Repeated shiftings are, however, essential to produce fine large flowers and handsome plants. As balsams, from their succulent nature, require a great deal of moisture, the saucers in which the pots stand may be kept constantly full of water; but this water should be changed every day. Balsams generally ripen seeds, even from the double flowers, and thus numerous varieties are raised. The seeds should, however, be used as fresh as possible; as it is found that when the seeds of the balsam are kept for more than a year, the plants produced by them are smaller, and all their flowers inferior, both in size and colour. The more choice varieties may be preserved by cuttings, which root readily in sand kept moist below, but dry at top, and covered with a bell-glass. The seed-pods of *Balsamìna*, and those of *Impàtiens*, or *Touch-me-not*, open with a jerk when touched, so as to throw the seeds to a distance.

BAMBOO.—See Bambùsa.

BAMBUSA.—*Gramineæ.*—A rapid growing stove-plant, which has a noble appearance where there is abundance of room. There are some species so hardy as to stand the open air in the island of Jersey; and one of these, *B. nìgra*, will thrive in a green-house, or against a conservatory wall, in the climate of London. The Bamboos should be grown in loamy soil, and they are increased by offsets.

BANANA.—See MUSA.

BANEBERRY.—See ACTÆA.

BANKSIA.—*Proteaceæ.*—Evergreen New Holland shrubs, some of which have showy flowers, but which are generally more remarkable for the beauty of their leaves, which are curiously notched and cut. All the species grow well in a mixture of sandy peat and loam, with the pots well drained; and cuttings of the young wood root with some difficulty in sand under a bell-glass, in a very slight bottom heat.

BANYAN TREE.—See FICUS.

BAPTISIA.—*Leguminosæ.*—Herbaceous pea-flowered plants, from North America, of vigorous growth and of rather elegant appearance, of which one species, *B. austràlis*, well deserves a place in collections. They may be grown in the open air in common soil, and may be propagated by division of the root.

BARBADOES CHERRY.—See MALPIGHIA.

BARBADOES GOOSEBERRY.—See PERESKIA.

BARBA JOVIS.—A species of Anthyllis.

BARBAREA.—*Cruciferæ.*—Perennial plants, of which one species, *B. vulgaris flòre-plēno*, the double yellow rocket, is of easy culture and propagation, either by cuttings or division of the root, in common soil.

BARBERY. See BERBERIS.

BARK.—The refuse bark which has been used for tanning leather, and which produces considerable heat by its fermentation. When obtained from the tannery it is generally soaked in water, and then spread out in an open shed, and turned over several times; after this, it is laid in a ridge or heap, and when it has begun to heat, it is again turned over once or twice, when it is fit to be put into the bark-bed. In this bed or pit it continues to ferment, and gives out heat for several months; and when the heat begins to decline, fresh bark is added from the reserve stock in the shed. The bark-bed may be of any dimensions in regard of length and width, but it should seldom be more than two feet in depth, to prevent an excess of heat. The plants in pots are generally plunged in it, at first to half the depth of the pot, and afterwards to the rim. Substitutes for bark are stable dung, leaves of trees, chaff, and any other vegetable or animal substances which ferment in decaying; and in large towns the sweepings of streets may be used, as these, in some of the London gardens, are found to produce a steady and durable heat in hot-beds and pits, during the summer months. The best substitute for the peculiar heat of the bark is, however, a mass of stones heated by steam, or a mass of soil, or sand, heated by pipes of hot water.

Bark, or Moist Stove.—A plant structure with a glass roof, and a bed or pit in its centre, containing a mass of fermenting matter, or of earth or sand, heated by artificial means, in which plants in pots are to be plunged. The plants grown in such houses being natives of the warmest parts of tropical countries, the temperature in a bark-stove should never be lower than 60°, and during summer it may rise as high as 80 or 90°. In general, the heat ought to be greatest in the day-time, and during bright sunshine, and least during night, throughout the year. To supply the air in the house with sufficient moisture, the floors of the passages should be frequently watered; and to facilitate the same object, and to subdue insects, the plants should be syringed or watered over head, most days in the year, and especially in the summer season, about 3 o'clock in the afternoon. After this watering the house should be shut up for the night; excepting when the weather is very warm, when some air may be given by opening the sashes at 8 or 9 o'clock at night, and leaving them open till the following morning, at 6 or 7. Independently of the bark-bed, the air of the moist stove requires to be heated by pipes of hot water or steam, or by smoke-flues; the first mode being found by experience to be best.

Barrow. See Wheel-barrow and Hand-barrow.

Bartonia.-*Loasaceæ.*—*B. aurea* is a new and splendid annual, with golden yellow flowers, which have quite a metallic lustre when the sun shines upon them. The seed-pod is curiously twisted. Like all the Californian annuals, it is very apt to die off if the roots become at all withered by drought, or if the collar of the plant be exposed to the full heat of the sun; and it thus does best when grown in masses, so that the ground may be quite covered with its leaves. *B. albescens* has greenish white flowers, and is not worth growing. (See Annuals.)

Bast, or Bass.—The inner bark of the lime-tree, separated by steeping the bark in water till it can be readily pulled asunder into ribands or strands; these are hung up for some months in the shade, and they are then woven into mats. The manufacture of these mats is confined to Russia and some parts of Sweden, where the name for bark is bast.

Bastard Acacia.—See Robinia.

Bay Tree.—See Laurus.

Bastard Saffron.-See Carthamus.

Batatas.—The sweet potato; a kind of Convolvulus, the root of which is eaten.

Bauhinia.-*Leguminosæ.*—Mountain Ebony. Stove shrubs, mostly with white flowers, and remarkable for their leaves always being produced in twins, on which account the genus was named in compliment to J. and C. Bauhin, both eminent botanists.

Bead Tree.—See Melia.

Beaufortia.—*Myrtaceæ.*—Splendid New Holland shrubs with scarlet and red flowers, free-growers and abundant-flowerers, and well adapted either for planting out in a conservatory, or growing in pots. The best soil is sandy loam and peat, well drained; and cuttings, taken off with a small portion of half-ripened wood, root freely in sand under a bell-glass. *B. decussàta*, which produces its scarlet flowers from May to July, is one of the handsomest species.

Beaumontia, Wal. — *Apocyneæ.* —Climbing shrubs from the East Indies, of elegant foliage and large white flowers, of easy culture in the stove, and propagated by cuttings either of the stem or roots. The best soil is sandy loam, mixed with rotten dung or leaf mould. By proper management they may be made to flower in the open air. See Allamanda.

Beds for Flowers commonly form part of an assemblage of beds, which constitute what is called a flower-garden, and sometimes, though improperly, a Parterre. (See Flower Garden.) Flowers are planted or sown in beds, either with a view of covering the bed with one entire mass of foliage and flowers, or of distributing single plants, or small tufts of plants and flowers, over it at regular distances, with naked spaces showing the soil between. The plants most suitable for completely covering the bed are trailers and creepers; and those for standing singly at regular distances are erect plants, which have their flowers in terminal spikes, corymbs, or umbels, or compact-growing plants, which make neat little bushes. All other herbaceous flowers, such as the tall-growing Salvias, Sunflowers, Persicarias, Dahlias, Hollyhocks, &c. are better grown in the borders, in rows, or in small groups in a border, *or on* a lawn. When a bed is to be entirely covered with flowers, the stems often require to be pegged down with hooked sticks, so as to cover every part of the bed equally; and in wet seasons, when the plants are apt to run too much to leaves, the lower extremities of the shoots ought to be slightly bruised, so as to check their growth by lessening the rapidity of the return of the sap. The larger roots may also be cut for the same purpose, and in some cases the effect of a check will be given by watering once or twice with salt and water. In situations where the bottom is naturally moist, the whole flower-garden ought to be effectually drained, and those beds which are intended to be wholly covered with trailing plants, ought to have a comparatively thin stratum of soil. On the other hand, those beds which are intended for tall, vigorous growing plants, ought to have a deep substantial soil. It may be laid down as a general principle, that the manager of a flower-garden may add greatly to its beauty in a dry season by the judicious supply of water, which ought to be given in the evenings; and in a wet season by withholding water, thinning out the leaves and branches, and checking over luxuriant growth by bruising the branches at their junction with the stem, or bruising the roots in the case of trailing plants and creepers, and cutting through some of the principal roots, six or eight inches under ground, in the case of the more vigorous-growing plants.

Begonia.—*Begoniaceæ.* — Tropical under-shrubs or herbaceous plants, some of which require the stove and others the greenhouse. The flowers are showy, mostly pink and white, and the leaves are succulent, mostly oblique at the base, and red underneath. On the whole, the plants are highly ornamental, and they are of the easiest culture and propagation in light rich soil. One of the finest specimens is *B. octopetala,* which has tuberous roots, but it is rather rare. *B. discolor*, which has the leaves beautifully veined with crimson underneath, is the commonest species, and it thrives in the greenhouse, and does remarkably well in rooms, throwing out numerous suckers, each with a small tuberous root, which only requires separating from the parent and potting, to become a fresh plant. The only objection to its culture is, that it is very apt to be infested with the red spider (see Acarus). When planted out in the summer season, it continues to produce flowers for several months. Indeed, all the tuberous-rooted species of this genus, if planted rather deep in a dry sandy border exposed to the south, and having the soil covered with a little rotten tan, dung, leaves, or with litter during the winter season, will come up and flower freely every year; as the tuberous-rooted species of Begonia are scarcely more tender than the tuberous-rooted species of Solanum, or than the Dahlia. All the kinds of Begonia being at once beautiful, singular, of the easiest culture and propagation, and producing flowers wherever there are leaves; it is one of the best families of plants for an amateur to commence his exotic culture and experiments.

Belladonna.—One of the names for Atropa belladonna, the deadly-nightshade.

Belladonna Lily. — See Amaryllis.

Bell Flower.—See Campanula.

Bell Glass.—A glass cylinder, with a globular top, used for covering tender cuttings or seedlings. It differs from a hand-glass in being all in one piece; whereas a hand-glass consists of several pieces fixed in a frame of lead, wood, or iron.

Bellis.—*Compositæ.*—The Daisy. Well-known perennials, of which *B. perennis*, the common daisy, has been in cultivation in British and continental gardens from time immemorial. The most beautiful varieties are the large double, the large quilled, and the hen and chickens. They are all admirable plants for making edgings to borders, and they are well suited for growing in pots, though at present they are almost neglected. They thrive best in loamy soil, and bear transplanting even when in flower, provided they are taken up with a portion of soil attached. No plants are better adapted for covering a bed with one mass of colour. Masses of any of the kinds of daisies may be brought from the reserve ground and laid down on a bed in the flower-garden, when just coming into flower, and taken back again to make room for other plants, when they have gone out of flower.

Bellows for Fumigation.—A machine composed of the common bellows, or patent blower, used for blowing fires, with the addition of a tube or vessel for containing tobacco, pierced with holes. The tobacco is placed in this vessel, and being lighted, the air is blown through it, which forces out the smoke so as to fill the pit, frame, or house which contains the plant or plants which are to be fumigated for the destruction of insects.

Belvidere, or Summer Cypress.—See Kochia.

Benthamia.—*Cornàceæ.*—A very handsome evergreen shrub, with large white showy flowers, which are succeeded by scarlet fruit having the appearance of a large strawberry. It is somewhat tender, and north of London requires a wall. It thrives best in loam, and may be propagated by layers, cuttings, or seeds, which it produces in abundance.

Berberis. — *Berberideæ* — The Berberry. Deciduous shrubs, natives of Europe, North America and Nepal, several of the species of which are very ornamental for their flowers, and also for their fruit. *B. vulgàris*, the common Berberry, is a most elegant plant when trained to a single stem, and then allowed to expand its head freely on every side: so treated the branches become drooping, and have a fine effect every spring, when they are covered with their rich yellow blossoms; and in autumn, from their long red fruit, which at a distance might be mistaken for the flowers of a scarlet Fuchsia. *B. aristàta*, with splendid bright yellow flowers, is a robust species, with purplish fruit. *B. asiatica*, is less robust, but also a very free flowerer. All the species are quite hardy, thriving in any common soil, and easily propagated by ripened cuttings, layers, suckers, or seeds. (See Mahonia.)

Berberry.—See Berberis.

Bergamote. — A kind of mint. See Mentha.

Beto'nica. —*Labiàtæ.*— Betony. Herbaceous plants, natives of Europe, of which one species, *B. incàna*, H. K., is very ornamental, and particularly adapted for rock-work or pot culture; or for covering the entire surface of a bed in a flower-garden. The flowers are flesh-coloured, in spikes, and the whole plant does not exceed 6 inches in height. Common soil and suckers.

Bidens.—*Compositæ.*—The Bur Marigold. Annual and perennial plants, principally natives of England and North America, of which *B. grandiflora*, with fragrant yellow flowers, and *B. striata* with white flowers, are perhaps the most ornamental. They are both hardy annuals, which only require sowing in the open ground in April.

Biennials. — Plants that do not produce their flowers till the second year, and then die after they have ripened their seeds. The Brompton stocks, hollyhocks, wallflowers, snapdragons, and Canterbury bells, are biennials, though the latter four frequently live three or four years. Biennials should be sown in March or April, thinned out in May, and transplanted in September to the place where they are to flower the ensuing year. A little earth should be taken up with the roots, when they are transplanted, and they should be well watered, and shaded for a day or two, till their roots are established. Those kinds which require a peculiar soil, should have pits prepared for them about a week before they are transplanted, that the earth may have time to settle.

Bignonia. —*Bignoniaceæ.* —The Bignonias or trumpet-flowers once formed a very large and splendid genus, chiefly of climbers from tropical countries, and remarkable for their large, brilliant-coloured flowers. Many of the species have, however, been now removed to the genera *Tecoma* and *Spathodea*. Most of the plants which are still called Bignonia require the hothouse, but some will thrive in the greenhouse, and one, *B. capreolàta*, is hardy. *B. venústa* is one of the handsomest hothouse species, and when planted in the free soil, it will produce its pale orange flowers during the greater part of the summer. They are all of easy culture, requiring chiefly abundance of room, and cuttings of them all root readily in sand. (See Tecoma.)

Bilberry. See Vaccinum.

Bill, or Handbill. — A curved blade fixed in a wooden handle; if short, it is called a hand-bill, and if long, a hedge or pruning bill, and it is used for cutting hedges, or pruning off the branches of trees. (See Hedgebill.)

Billardiera — *Pittosporeæ.* — Appleberry. Climbing half hardy shrubs, natives of Australia, with bell-shaped flowers, and long berry-like fruit which tastes like roasted apples. The beautiful plant now called Sollya, was at first supposed to belong to this genus. They should be grown in sandy peat.—(See Australian Shrubs.)

Bindweed.—The common Bindweed (*Convolvúlus sepium* L., *Calystègia sèpium* R. B.) with large white flowers, and not unfrequent in hedges, is one of the most ornamental of the indigenous twiners; but in gardens it has this disadvantage, that its roots, or rather underground shoots, spread rapidly and are very difficult to eradicate.

Birds are generally considered enemies of gardens, and some kinds, as the common sparrow (when seeds, which are their usual food, are scarce,) are apt to live upon buds, especially blossom-buds, as being the largest; and others live upon fruits. As, however, all the soft-billed kinds, which constitute the great majority of singing birds found in our gardens, live upon insects, especially the aphides and the caterpillars or grubs of moths, flies, and beetles, they are rather to be considered as advantageous to gardens than otherwise.

Bird Cherry.—*Cerasus Padus.*—(See Cerasus.)

Bird's-eye, the *Prímula farinòsa*, a very neat little plant, cultivated in peat soil and kept moist.

Bird's-foot.—(See Ornithopus.)

Bird's-foot Trefoil. — (See Lotus.)

Birthwort.—(See Aristolochia.)

Biscutella.—*Cruciferæ.*—Buckler Mustard. Hardy annuals with yellow flowers, natives of Europe, which only require sowing in the open border in March or April.

Bitter-sweet.—*Solànum Dulcamàra.*—An indigenous suffrutescent climbing shrub, with pretty flowers and red berries, common in hedges.

Bitter-vetch.—See Orobus.

Blackberry.—The common name of the bramble.—(See Rubus.)

Black Bryony.—(See Tamus.)

Bladder Ketmia.—*Hibiscus Trionum* and *Africanus.*—Hardy annuals, natives of Italy and Barbary. The seeds should be sown in March or April.—(See Annuals.)

Bladder Nut.—(See Staphylea.)

Bladder Senna.—(See Colutea.)

Blandfordia. — *Hemerocallideæ.* — Showy plants with scarlet and green tube-like flowers; natives of New South Wales, of which *B. nóbilis*, and *B. grandiflora*, well deserve culture. Both species should be grown in sandy loam and peat; and they are increased by seeds, or suckers.

Blast.—A popular and vague term applied to plants which have been suddenly blighted by the effect of unpropitious weather, or some other circumstance so as to check or destroy the growth of the flowers, or seeds.

Blessed Thistle. — See Centaurea.

Bletia. — *Orchidaceæ.* — Showy plants, natives of the tropics, and requiring stove heat in Britain. They should be grown in sandy loam and peat; and they are propagated by division of the roots.

Blight.—A popular term for the sudden injuries which plants receive, apparently from the weather, but in reality from the attacks of insects, or the growth of parasitic fungi. In general, whenever the progress of plants is suddenly arrested by some cause not understood, it is attributed to blight. Blight differs from mildew, which is always a fungus, in the latter exhibiting a white, bluish, or mouldy appearance.

Blitum.—*Chenopodiàceæ.*—Annuals of the easiest culture, of no beauty with respect to the flowers, but remarkable for the showy appearance of their spikes of succulent scarlet fruit. The English names of the species are strawberry blight and spinach blight.

Blood-flower.—See **Hæmanthus.**

Blumenbachia. — *Loasaceæ.* — Dwarf annuals, with pretty white flowers, and very curiously twisted seed-pods; which only require sowing in the open border in April. There is, however, one drawback to their general cultivation, which is, that they sting as badly as a nettle.

Bluebottle.—See **Centaurea.**

Bluets.—See **Centaurea.**

Bog earth.—See **Peat** and **Heath Mould.**

Bona Nox.—See **Ipomæa.**

Bonapartea.—See **Lyttæa.**

Borage.—See **Borago.**

Borago. — *Boragineæ.*—Annual and perennial plants with blue, white, or pink flowers. Natives of the South of Europe and Persia; of easy culture in any common soil.

Border.—A border differs from a bed in having a walk only on one side; and an ornamental border, in which flowers or shrubs, or both, are grown, ought to have the plants so arranged in regard to height and distance, as to have them seen to the greatest advantage from the walk. For this purpose the lowest-growing plants should be placed in front, and the highest kinds behind them, and the distance between the different plants should be proportioned to their breadth, not to their height; because a very tall-growing plant, such as the common lily, is sometimes a very narrow one, and a low bushy plant, such as the peony, is sometimes three times as broad as it is high. Hence, in a border which is to be composed of a great variety of flowers, the plants cannot be placed in rows, or at regular distances; but a space must be apportioned to each plant according to its width keeping in view the necessity of always leaving a clear space of a few inches, round every plant whether large or small. The spaces round the large plants, say those which are from one to three feet in diameter, ought not to be less than six inches or nine inches on every side; while those round the small plants, under six inches in diameter, need not be more than three inches. It is much better to have the spaces too wide than too narrow; for in the latter case, an appearance of confusion is produced; while in the former order and proportion appear to reign through the whole. The same general principles and proportions will apply in the case of a border composed wholly of shrubs. (See **Shrubbery.**) With regard to the mode of arranging herbaceous plants in borders with reference to the colour of their flowers and time of flowering, the object ought to be to have an equal number of plants in flower in each of the floral months; and among the plants of each month to have as nearly as possible an equal number of each of the principal colours. This is the beau ideal that the cultivator should keep in view; but it is not easy to carry it out into practice without the assistance of a reserve garden, and a number of plants in pots, that can be brought out when in flower on the shortest notice, and substituted for any plant which perhaps has not come into flower sufficiently soon, or which has not produced a proportionate quantity of flowers. In actual practice in this case, as in many others, where strict rules are laid down to act upon, the object is endeavoured to be obtained by what gardeners call trial and correction, and the consequence commonly is, that it is never attained effectually. To explain this, we may suppose a gardener about to plant a border of flowers which is to contain five hundred plants. He first collects five hundred kinds of as many colours as he can, and out of these he selects those of one colour, say blue, and distributes them equally over the border, guessing at the height the plants may attain, and placing them in the front, back or middle accordingly. He does the same with all the other colours, and next summer, when the plants are in flower, he shifts them about; taking them up with balls, so as to avoid having two of the same colour coming into blossom in the same month near together. A tolerably good effect may be produced in this manner by a careful, active, and intelligent gardener; but it will require incessant attention and labour; and after all the result will be very inferior to what it would have been had the subject been regularly studied, and a plan of the border made for every floral month, say from April to November inclusive, a circle representing each flower and being coloured accordingly. There are very few borders in England that have been planted with this degree of care, because the prevailing fault of the employers of British gardeners is, a desire for quantity as indicating power, rather than of quality as indicating taste. The amateur who has a small garden, and is anxious to make the most of it, may, if he will take the trouble to select the very finest flowers, and to arrange them according to their sizes, colours, and time of flowering, produce an effect which he will not see in the garden of any professed gardener that we know of.

Border Flowers. — Herbaceous plants of hardy constitution; showy in appearance, and of easy culture, and therefore well adapted for ornamenting the borders which accompany walks in gardens. These are classed as perennials with fibrous roots, perennials with bulbous or tuberous roots, biennials, and hardy annuals. Among the the fibrous rooted perennials are some, such as certain species of saxifrage, pinks, carnations, &c., which are evergreen, and these are most desirable plants for the borders of winter gardens. There are also evergreen biennials, such as wall-flowers, stock gilliflowers, &c.

Boronia.—*Rutaceæ.*—Evergreen New Holland shrubs, which flower during the greater part of the summer, and which are all very ornamental. *B. serrulata* is a most desirable species, forming a neat compact plant for a room, or greenhouse, and requiring plenty of light and air, but very little heat. It, and all the other species, will grow freely in sandy peat, well drained, and they may be propagated by layers or cuttings of the young wood in sand, under a bell-glass, taking care to wipe the glass frequently, so as to keep the cuttings free from damp.

Bossiæa.—*Leguminosæ.* — Evergreen New Holland shrubs, which all thrive in a mixture of turfy loam, peat, and sand, well drained, and which may be propagated by cuttings of the young wood.

Botanic Garden.—A garden devoted to the culture of plants with a view to botanical science; and in which the plants are arranged according to some system, only one of a kind is planted, and a name appended to each. The most convenient mode for study is to place the plants in straight rows of narrow beds, one row in a bed, with a narrow path between; but the best mode for effect is to place them in groups of one order, tribe, or genus in a group. These groups have the best effect when of a circular form, and when placed on a lawn. The position of the groups relatively to each other should be such as to correspond with the botanical system followed.

Bottom heat is the warmth imparted to the roots of plants, by plunging the pots in which they grow into a hot-bed or bark-pit. The effect this produces in stimulating the plants is very great; and it is particularly advantageous in striking cuttings, which, under ordinary circumstances, would not readily throw out roots. Bottom heat is often very useful in enabling hothouse plants to stand in the open air during summer. A bed may be formed of bark, decayed leaves, or stable manure, in which the pots may be plunged, and the surface covered with a thin coating of turf; and in this manner all the hothouse climbers might be trained over the trellis-work of a veranda, and palms, bananas, and other tropical plants might be made to decorate an English garden.

Bouvardia.—*Rubiàceæ.*—*B. triphylla* and its varieties are very ornamental, with scarlet flowers and smooth shining leaves. It, and all the other species, grow freely in loam and peat in a warm situation; and they are increased by cuttings of the roots. ***B. versícolor*** has fine red flowers and is very ornamental, though more tender than ***B. triphylla.***

Bowers.—Slight arbours, formed by training climbing shrubs over trellis work so as to form a covered seat. They only differ from arbours in being less closely covered. See Arbours.

Box-tree.—See Buxus.

Box-edgings.—The kind of box used for this purpose is ***Búxus sempervírens nàna.*** For its culture, see Buxus and Edgings.

Brachyse'ma.—***Leguminoseæ.***—*B. latifòlium* is a very ornamental New Holland climber, with fine large glaucous leaves and crimson flowers; and it grows freely in loam and peat, flowering abundantly, and ripening seeds, by which, or by layers, or cuttings, it may be readily propagated.

Bramble.—See Rubus.

Briza.—*Gramineæ.*—Quaking-grass. ***B. media,*** the common kind, is a perennial, and ***B. maxima,*** a gigantic species, is an annual, requiring only to be sown in March or April, in the open borders.

Brompton Stocks.—***Mathiola incana.***—These splendid flowers are biennials, and their seed should be sown early in May, in a border of light sandy soil with an eastern exposure, and never in front of a hothouse or south wall, as they cannot bear too much heat. The seeds should be sown very thinly in narrow drills, made about six inches apart. As soon as the plants begin to grow, and have expanded their second pair of leaves, they should be watered every evening with a watering-pot or garden-engine, having a very fine rose. When the plants are about three inches high, they should be thinned out so as to be at least six inches apart, and the plants removed should be carefully replanted in another bed. In about a month's time they should be thinned again, the alternate rows taken up, so as to leave the remaining plants about a foot apart every way; the plants removed being taken up with balls of earth and carefully transplanted, watered, and shaded till they have re-established themselves. Great care is necessary in transplanting, as the stocks have long tap-roots, with very few fibrils attached. When the plants are wanted to be very fine, they may be protected during winter by hoops and mats, or hand-glasses, but in general this is not thought necessary. In March or April a compost should be formed of very sandy loam or sand, enriched with the remains of an old hot-bed, or vegetable mould, formed of decayed leaves;

and pits about two feet deep and two feet in diameter dug in the flower-borders and filled with it, into which the stocks should be transplanted, with as large balls of earth attached as can be taken up. They should be carefully shaded and watered till they have taken root; and afterwards they should be watered every night till they come into flower. Thus treated, the spikes of flowers will sometimes be from eighteen inches to two feet long, and proportionably thick.

Broom.—See Spartium and Genista.

Browa'llia.—*Scrophulárinæ*, or *Solanàceæ.*—South American tender annuals, generally with blue flowers, requiring to be raised on a hot-bed, and generally grown in pots. (See Annuals.)

Brugma'nsia.—*Solaneæ.*— Peruvian shrubs, or low succulent stemmed trees, of which *B. suaveòlens*, (better known by the name of *Datura arborea*) and *B. sanguìneæ*, are magnificent species. Being large plants, growing to the height of ten or twelve feet, they look best when planted in the ground, in a conservatory; but they will grow well in large pots: or they may be planted in the open garden in the summer season, and taken up and preserved in a back shed from which the frost is excluded during winter, to be re-placed in the open border the following spring. The flowers are trumpet-shaped, one foot or more in length, and very fragrant. The plants grow freely in light rich soil; and they are readily propagated by cuttings, either of the shoots or roots.

Brunsvigia.—See Amaryllis.

Bryony. — See Tamus; under which both kinds are described.

Buck-eye.—The American name for the smooth-fruited horse-chestnut. (See Pavia.)

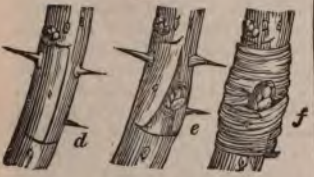
Buckler Mustard. — See Biscutella.

Buck-thorn.—See Rhamnus.

Budding is an operation for propagating ligneous plants, as a substitute, in particular cases, for grafting, or other modes of propagation. In floriculture, it is more particularly used for propagating select species of roses. The time of performing the operation is from July to September; and the mode is as follows:—The first thing to be done is to select a young shoot of the current year, from which the bud is to be taken, and a stock of one or of several years' growth, into which the bud is to be inserted. The bud is cut out with a portion of the bark, and the wood attached above and below the footstalk of a leaf, in the axil of which leaf the bud is situated. To do this, a sharp penknife or budding-knife is inserted in the shoot, about three-fourths of an inch below the bud, and passed up beneath the bud to about half an inch above it; the bud, with the bark and wood to which it is attached, is then held in the left hand, and with the knife in the right hand the thin film of wood is quickly picked out, leaving the bud attached to a piece of bark, technically called the shield. A slit is then made in the back of the stock, about one-third of an inch in length, and a transverse cut is made within one-fourth of an inch of the upper part of the longitudinal slit. The bark is opened on both sides of the longitudinal slit by means of a thin flat piece of bone or ivory; or, in Nursery practice, with the end of the handle of the knife, which is made thin on purpose. The bud is now inserted in its natural position, with the bud looking upwards, and a portion of the upper part of the bark to which the bud is attached is cut across, so as to fit to the transverse cut which was formed in the stock.

The bud is made fast in its situation by tying it with a strand or ribbon of bast matting. This being done in summer or autumn, the matting remains on for a month or six weeks, according to circumstances, till the back of the bud shows, by its healthy appearance, that a vital union has taken place. The matting may now be loosened, and in a week or two altogether removed. By another mode, differing a little from the above, the cut across is made below the slit, as shown in *fig.* 1, in which *d* shows the cuts made in the stock, *e* the bud inserted, and *f* the bast mat applied.

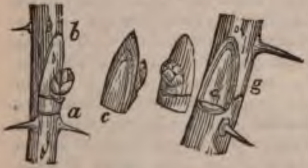
FIG. 1.



COMMON OR SHIELD-BUDDING.

Niche budding is when the wood is retained in the bud, as shown in *fig.* 2, in which *g* is the prepared stock; *c* the bud turned to show the wood, and *a b* the bud applied, which should afterwards be bound with bast mat, as before. In placing the bud on the stock in niche-budding, the principal thing to be attended to is, to bring the horizontal edges of the base of the niche in the stock, and those of the bud, which is to fit into it, into the most perfect contact possible; because the union is produced, not as in common summer budding, by the junction of the soft wood of the stock with the rudiment of the soft wood on the inside of the bark of the bud, but by the junction of soft wood with soft wood, as in common grafting. This mode of budding will always succeed best, when the niche in the stock is made where there is already a bud, (as shown at *g*) making the horizontal cut through the base of the bud.

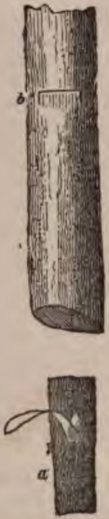
FIG. 2.



NICHE BUDDING.

Figs 3 to 6, show an improved mode budding, which has been lately found in France to be remarkably successful. The bud is prepared in the usual

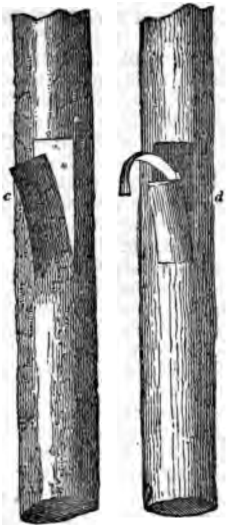
FIG. 3.



FRENCH BUDDING.

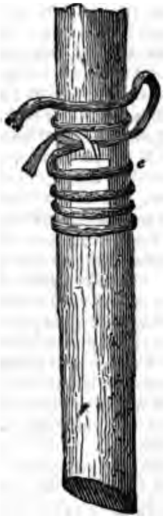
manner, except that both ends of the shield are cut square across, as at *a*, in *fig*. 3. On the stock the bark is cut horizontally, and vertically to a smaller extent, as indicated at *b*. This being done, the right hand of the operator applies the thin flat point, or spatula, of the handle of the budding-knife on one side of the incision, and passes it through to the other side; the strap of bark is then torn down, as shown at *c*, in *fig*. 4, the thumb being placed on the upper part of it, so as to hold it firm against the blade of the budding-knife, while with the left hand the bud or shield is inserted in its place. This being done, the shield is cut across, so as to fit exactly to the bark of the stock at its upper part; and, next, a portion is cut off the raised bark, so as to reduce it to such a length as will bring it exactly up to the lower side of the bud, as shown at *d*, in *fig*. 5. The bud is then tied, as shown at *e*, in *fig*. 6; but with the petiole of a leaf included in the upper part of the tie, the leaf suspended from which serves to shield the bud from the sun. By this mode of budding, the soft wood is less injured than by the common mode, in which it is always more or less scratched by the blade of the budding-knife, and is sometimes removed altogether; when, of course, the bud has no chance of success. This mode of budding is particularly adapted for thin-barked shrubs, and more especially for roses.

FIGS 4 AND 5.



FRENCH BUDDING.

FIG. 6.



FRENCH BUDDING.

Another mode is called annular flute-budding; in which a branch or shoot is chosen on the tree which is to be propagated, as thick as, or thicker than, the stock in which the bud is to be inserted. A ring of bark including a bud is then cut off from the branch of the shrub which it is to be propagated, and detached by splitting it longitudinally on one side. A similar ring of bark is then detached from the stock, and the former inserted in its place, and tied on with matting. This mode of budding is found particularly suitable for all trees or shrubs having thick bark. There are many other kinds of budding, but these are in the most general use.

It sometimes happens in the case of roses, that the bud will produce a shoot the same season in which it has been inserted; but it more frequently remains dormant till the following spring. At this period the stock should be cut over a few inches above the bud; and the shoot, as it grows, should be slightly tied to the portion of stock left on above the bud, in order to prevent it from being injured by high winds. The second year this portion of the stock may be cut off close to the bud.

Buds may be inserted in stocks at a few inches from the ground, in which case, the plants produced are called dwarfs; or in straight stems at four, five, or six feet from the ground, in which case the plants produced are called standards. The latter is the most common mode of budding roses and orange trees: but other shrubs and trees of rare or ornamental kinds are commonly budded within a foot, or a few inches from the ground. Sometimes buds of several kinds are inserted in the same stock; and sometimes buds are inserted in branches in different parts of a tree, for the sake either of supplying vacant places in the branches, or of producing several kinds on the same tree. Thus on climbing British roses, several varieties of Chinese roses may be budded; and on the single red camellia, several varieties of double red or white camellias.

In all cases of budding, it is essential that the stock shall not be very different from the bud to be inserted in it. In some cases it is even necessary that the bud and the stock should be of the same species; while on the other hand it sometimes happens that a bud may be inserted successfully in any stock which is of the same natural order. Thus the lilac, the olive, and the fringe-tree, may be budded on the common ash; all the four species being of the same natural order, *Oleàceæ*. Roses and thorns are the plants to which budding is most commonly applied by amateurs; and the finer kinds of the former genus are generally budded on wild briars of the dog-rose, and of the latter (***Cratægus***), on the common hawthorn.

Bu'ddlea.—*Scrophulàrinæ.*—Deciduous or evergreen shrubs, natives of India or South America, of which one species, ***B. globòsa,*** is worth culture in the shrubbery. It has fine golden yellow, ball-like flowers, growing in any common soil, and is tolerably hardy, though it is sometimes killed by very severe frost. It is readily increased by cuttings under a hand-glass.

Bulbs are plants which belong to a particular division of vegetables, having certain peculiarities which require a particular mode of culture. They are all, with scarcely a single exception, very ornamental from the very large size of their flowers in proportion to the entire plants, and from the brilliancy of their colours. Their principal peculiarity is, that they produce but a limited number of leaves every season; and hence, if these leaves are cut off or injured, no new leaves are produced that season. In all other herbaceous plants, when the leaves are destroyed, fresh leaves are produced to a comparatively unlimited extent; and hence, if the season be long enough, the plant may produce a sufficiency of foliage in the current year to enable it to mature flowers in the next. But in bulbs the case is different; the leaves produced are very few, and if they are shortened before they are fully grown, or cut off before they begin to decay, the bulb is deprived of nourishment to such an extent, as either not to flower at all the following season, or to flower very weakly. Thus, the great art in the culture of bulbs is to preserve all their leaves uninjured, to expose them fully to the sun and air, and by no means to cut them off till they have begun to decay at the extremities. By far the greater number of bulbs flower in spring, and produce their flower-stems immediately after they begin to grow; and shortly after they have flowered they cease growing, and remain dormant and without leaves during the remainder of the year. Hence, almost all bulbs require to be planted in autumn; and hence also, they require, free, dry, and somewhat rich soil, into which their roots may penetrate easily, and procure nourishment without difficulty for their rapidly-growing leaves. The bulb is in all cases strengthened by preventing the flowers from producing seeds; and in most cases it ought to be taken up, as soon as the leaves have decayed, and preserved in dry sand or earth, and in some cases on shelves, or in papers in a dry room, till the planting season in autumn. Bulbs which are indigenous to Britain, such as those of the common wild Hyacinth, and some of the Narcissi, receive little injury from remaining in the ground all the year; but improved varieties of indigenous bulbs, and all bulbs from warm climates, such as those of the Hyacinth, the Ixias, &c., are greatly injured by the moisture of our summers; and when left in the ground, require the interposition of art to keep the soil tolerably dry. From the circumstance of bulbs growing with great rapidity when in a state of vegetation, they require abundance of water; and this is the reason why the soil in which they are planted should always be deep, so as to retain moisture. A bulb is essentially a bud, and contains within itself the germs of the leaves and flowers which are to be produced the following season. In plants belonging to the other division of vegetables, those with netted leaves, or what are called *Dicotyledonæ,* a plant which is weak in the beginning of the year, may, by increased care and nourishment, be made to flower in the course of the season; but this is by no means the case with bulbs, not one additional leaf or flower being in their case capable of being produced during the season, that is not previously in an embryo state in the bulb. Thus, in one sense, bulbs are of more easy culture than any other class of plants; because the germ being previously formed, and the nourishment being provided in the body of the bulb, it is only necessary to supply heat and moisture to cause these to develope. Hence, the practice of growing bulbs of Hyacinths, Tulips, Narcissi, Crocuses, Irises, Snowdrops, Fritillarias, &c., placed over water in glasses, or vessels of earthenware, or in moist moss. Bulbs are increased by little bulbs called offsets, which are produced by the side of the old bulb. New bulbs are also formed every year in the Tulip and Hyacinth, at the side of the old bulb; in the Crocus and the Gladiolus, and many of the Cape Iridaceæ, over the bulb; and in the bulbous Irises, &c., under the bulb. Hence, in the cultivation of bulbs in the open garden, there is a constant tendency in some species to sink deeply into the ground, and in others to rise to the surface, which must be carefully counteracted by the cultivator, by taking up and replanting; thus, the bulbous Iris, when left three or four years in the ground, produces weak leaves, and ceases to flower freely, from the sinking of the bulbs; the Crocus, on the other hand, produces weak flowers and leaves from the bulbs rising above the surface; and the Tulip, if left in the ground for a few years, in consequence of the bulb being always produced at one side, is never found to come up twice exactly in the same spot. Experience proves, that certain bulbs which are in a state far removed from wild nature, require the greatest care to preserve them from disease, such as the cultivated Hyacinth. These, therefore, must be taken up every year, and carefully preserved; while others, comparatively incapable of much cultivation, such as the Snowdrop, may be left in the ground a number of years without injury. Bulbs, like all other plants, may be propagated by seeds; and from these, in the case of the Crocus and Hyacinth, the Crown Imperial, and Iris Xiphium, and Iris Xiphiodes, an endless number of beautiful varieties may be produced. This furnishes a fine source of interesting amusement to the amateur. The seeds should be sown in beds of light earth, where the plants may remain till they come into flower, which will generally be in from three to five years. The soil for almost all bulbs should be a free sandy loam, and the situation open, and fully exposed to the sun.

Bulboco'dium.—*Melanthaceæ.*—Bulbous plants, natives of Spain and the Crimea; flowering in March and August, and of easy culture in loamy soil. *B. vernum*, which does not grow above four inches in height, is a *irable* plant for growing in a pot.

Bulbocodium.—The Hoop-petticoat Narcissus; a pretty little species, not above six inches high.

Bupleu'rum. — *Umbelliferæ.* — Hare's-ear. Herbaceous plants, with greenish yellow flowers, and very glaucous or blueish leaves. They are natives of Europe, and will grow in any common garden-soil. Several shrubs are included by some botanists in this genus; but they were separated by Sprengel, and formed into the genus *Tenoria.* These are rather tender, being natives of the shores of the Mediterranean and the Cape of Good Hope; but near London they will bear ordinary winters in the open air. They should be grown in sandy loam.

Bur-Marigold.—See Bidens.

Burto'nia. — *Leguminòsæ.* — New Holland shrubs, of which *B. confèrta* is the most desirable species. It grows to the height of two feet, and produces its violet-coloured flowers from July to September. For its culture, see Australian Shrubs.

Butcher's Broom.—See Ruscus.

Butter and Eggs.—A kind of Narcissus.

Bu'tomus. — *Butòmeæ.* — The flowering rush. One of the handsomest of aquatic plants, deserving a place in every aquarium. It grows to the height of two feet, and produces its elegant head of pink flowers in June and July.

Butterflies.—These beautiful insects are never injurious to gardens except in their caterpillar state. As butterflies, they only sip a little honey from the flowers; their sole business being to propagate their species, and then they die. Thus, the butterflies that are almost always on the wing, and which are the males, may be suffered to flutter out their brief existence unmolested; but when a butterfly is found sitting on a branch with its wings folded, in bright sunshine, it should be destroyed, as the butterflies found in this position are generally females, just about to lay their eggs. Sometimes, butterflies thus placed, are found, when they are examined, to be dead; and when this is the case, the adjacent branches and leaves should be searched for eggs.

Butterfly Plants. — See Oncidium and Phalænopsis.

Bu'xus.—L.—*Euphorbiàceæ.*—There are only two species known; viz., *B. sempervírens*, and *B. baleárica*, the Minorca box, both hardy shrubs or low trees. The former is one of the most valuable plants in European gardens, both as an undergrowth in woods, and as an ornamental hedge for sheltering gardens. Box is also much used for forming edgings to walks; but the kind employed for this purpose, though it is considered to be only a dwarf variety of *B. sempervirens*, is so different from the tree-box in its habit, that it might almost be considered as a distinct species. The box-tree has been grown in European gardens almost from time immemorial. It was one of the principal ornaments in the gardens of Pliny; and in more modern times the dwarf box was almost the only plant used for forming the embroidery or scroll-work, or whatever that terrestrial arabesque may be called, which came into fashion in the time of Louis XIV. At present, this kind of scroll-work is no longer in use; but the dwarf-box is still a favourite for edgings to beds, and it will be perhaps always preferred to all other plants, from its hardiness, easy culture, and compact habit of growth. It is also evergreen, and of great duration; it is easily propagated, and bears clipping or cutting remarkably well. It is readily propagated by taking up the plants, and after dividing them, replanting them farther apart, and a little deeper than they were before. It will grow in any soil not saturated with moisture, and it may be cut or clipped at any season of the year. The best time for clipping box, however, is about the end of June; after which, especially if well-watered, the box makes a second shoot of half an inch, or an inch in length, which obliterates the marks of the shears. To form edgings of box properly, is an operation of gardening that requires considerable care. First, the ground should be rendered firm and even; secondly, a narrow trench should be accurately cut out with the spade in the direction in which the edging is to be planted; thirdly, the box should be thinly and equally laid in along the trench, the tops being all about an inch above the surface of the soil; and fourthly, the soil should be applied to the plants, and firmly trodden in against them, so as to keep the edging exactly in the position required. The trench is, in general, made on the side next the walk, and after the soil is pressed down, and the walk gravelled, the gravel is brought np, over the soil, close to the stems of the box, so as to cover the soil at least an inch in thickness, and to prevent any soil being seen on the gravel-walk side of the box. A box-edging once properly made, and clipped every year, so as to form a miniature hedge, about three inches wide at bottom, three inches high, and two inches wide at top, will last ten or twelve years before it requires to be taken up and replanted; but, if the edging be allowed to attain a larger size—say, six inches wide at bottom, six inches high, and three inches wide at top,—it will last fifteen or twenty years, or probably a much longer period.

Box-hedges for shelter are treated like other hedges, and being clipped at the same period as box-edgings, will last for an unknown period, probably for centuries; provided the surface of the hedge, or, in other words, the points of the shoots, are cut back occasionally, so as to admit the air to the centre of the hedge. The box, when used to execute arabesques, or scroll-work on the ground, is not allowed to grow higher than two or three inches, and is cut quite flat at top; the entire figure of the arabesque being formed of box, without the introduction of flowers or other plants; though occasionally with the addition of small cones or globes of box rising up from the terminal points of the arabesque figure. These cones, pyramids, globes, or other figures, are kept in correct shape, by being clipped every year. When verdant sculpture was in fashion, no tree excepting the yew was so well adapted for it as the box; and the tree was cut into the proper shape, by putting a wire-frame of the desired form over the tree, and clipping the branches to it.

C.

Caca'lia, L.—*Compósitæ.*—*C. coccínea*, L., *Emilia coccinea*, Cass., is a half-hardy annual, with a bright scarlet flower, somewhat resembling that of the common groundsel. It it is cultivated for the brilliancy of the colour of its flowers, though it is scarcely worth the trouble it requires; as it must not only be raised on a hotbed, but its long slender stalks must be staked and tied up, to make it look at all neat. There are several perennial species of Cacalia, but they are very seldom seen in British gardens.

Ca'ctus, L. — *Cactàceæ.* — The very remarkable succulent plants, arranged by Linnæus under the name of Cactus, have been distributed by modern botanists over numerous genera, which they are still continually changing and re-arranging. At first a few plants were left in the genus Cactus, but now that genus is annihilated, and seven or eight new genera substituted for it; still, as all the plants that once composed it, and the new ones of the same nature that collectors are continually sending home, are known by the general name of Cacti, it has been thought advisable to give here a slight sketch of the whole family.

In the time of Linnæus, very few Cacti were known; and even in the year 1807, Persoon enumerated only thirty-two, but now above five hundred living species are to be found in a single collection; and numbers of new species are being sent home by collectors every year. These new species are chiefly found in the tropical regions of America, but they extend over 75° of latitude, some being found near the boundary of the United States, and some near the town of Conception, in Chili. By far the greater number, however, grow in the dry burning plains of Mexico and Brazil, where they are subjected to the alternate seasons of extreme moisture and extreme drought. In these arid plains, where all nature seems parched up for six months in every year, the Cacti have been mercifully provided to serve as reservoirs of moisture; and not only the natives, by wounding the fleshy stems with their long forest-knives, supply themselves with a cool and refreshing juice, but even the cattle contrive to break through the skin with their hoofs, and then to suck the liquid they contain —instinct teaching them to avoid wounding themselves with the spines.

The Cacti are arranged by nature in several distinct groups; the first of which consists of the tree Cacti, or those kinds of Cereus, which have long slender stems, and which usually grow on the summits of the mountains of Brazil, forming a singular kind of crest. These are generally thirty or forty feet high, and sometimes are branched like candelabra, and sometimes consist of only one naked stem, not thicker than a man's arm, though of such enormous height. The Mammalarias, and Echinocacti, or Porcupine Cacti, which form another group, grow in the valleys of the temperate regions, generally in loamy soils, and low grass; and the Opuntias and Peresias, which form two others, are also principally found in the temperate latitudes. The Melocacti, or Melon-Cacti, and the Rhipsalis, which has narrow-jointed stems, are two other groups which are only found in the hottest parts of the tropics Among the many peculiarities of this family of plants, it may be mentioned, that if collectors cut off the top of any of the cacti which they may find in flower, and send it with the flower on it to England, the seeds will perfect themselves, and ripen on the passage home, from the supply of moisture contained in the divided part.

With regard to the culture of the Cacti in this country, it is found, that generally speaking, they ought to have a season of complete rest followed by one of violent excitement; that is, they ought to be kept almost without water from October to March, and then watered profusely while they are coming into flower. They ought all to be grown in pots well drained with cinders, instead of potsherds, as the latter retain too much moisture for the delicate and succulent roots; and they all enjoy bottom heat, which makes them throw out abundance of fibrils. When received late in the year, that is to say in October or later, they should not be potted till the following spring; and when raised from seed, (which is frequently sent over, even in dead specimens,) the seed should be sown in silver sand, and the young plants when transplanted should not be watered for several days.

Cæsalpi'nia, Pluk. — ***Leguminosæ.***—The splendidly-flowering plant, known in the West Indies by the name of the Barbadoes Flower-fence, which was formerly called ***Poinciàna,*** is now included in this genus. It requires a stove, and should be grown in a mixture of loam and peat, with abundance of room for its roots. It is propagated by cuttings struck in sand, in a moist heat under glass. The other plants belonging to the genus are seldom found in British gardens.

Cala'mpelis, D. Don.—See **Eccremocarpas.**

Calandri'nia. — ***Portulàceæ.*** — Peruvian and Californian plants, with fleshy leaves and showy flowers, generally treated as annuals, but most of which will live two or three years in a greenhouse. There is some confusion about the specific names; the plants figured in the Botanical Magazine as *C. speciòsa*, and *C. grandiflòra*, being quite different from those figured under these names in the Botanical Register, and known by them in the London nurseries. Of the kinds sold in the London seed-shops, *C. arenària* has small flowers, and is not worth growing; *C. speciòsa*, Lind. (*Talìnum ciliàtum*, Ruiz et Pavon,) is a Californian annual, with beautiful rich crimson flowers, which seem reclining on their bed of dark green leaves, and which have no fault but that of closing at four o'clock in the day; *C. grandiflòra*, Lind., the flowers of which, notwithstanding its name, are much smaller than those of the *C. dìscolor*, Lind.; the latter being one of the most splendid flowers that will grow in the open air in England. The seeds of the latter two species (both of which grow rather tall) are generally raised on a slight hotbed, but they may be sown in a warm border in the open air in April, when they will flower in June.

Calcareous Soils.—Soils containing a considerable portion of lime or chalk, mixed with sand or loam, and decaying vegetable and animal matter. Calcareous soils are generally very productive; and when manured, they retain and give out slowly the nourishing parts of the manure longer than any other kind of soil.

Calceola'ria. — *Scrophulárinæ.* —Perhaps no plants hybridize more freely than the different species of this genus; and what is remarkable is, that the shrubby kinds appear to unite freely with those that are herbaceous. In 1820, only half a dozen species were known, only one of which, *C. corymbòsa*, Cav., with large yellow flowers, had any pretensions to beauty. In the next ten years, five or six more species were introduced from Chili, two of which, *C. arachnöìdea*, and *C. purpúrea*, Grah., had purple flowers. The latter closely resembled *C. corymbòsa* in its habit of growth; and about April, 1830, the happy idea struck the late Mr. Penny, of the Milford Nursery, to attempt to hybridize them. The result was the hybrid, *C. Gellaniàna*, the flowers of which were orange and dark brown. Mr. Penny then tried *C. arachnoidea* as one of the parents, instead of *C. purpurea*, and he produced the magnificent Calceolaria, which he called *C. Youngii*, and which is still common in collections. In 1831, the spotted-flowered Calceolaria, *C. crenatiflòra*, Cav., (*C. péndula*, D. Don,) was introduced, and from this several splendid hybrids were raised. Some cultivator was then induced to try to hybridize one of the shrubby kinds, *C. bicòlor*, the flowers of which were pale yellow and white, with the herbaceous kinds having dark yellow and purple flowers, and some beautiful plants were the result. From that time to the present, innumerable hybrids have been raised every year, varying through every possible shade of crimson, brown, orange, purple, pink, and yellow, sometimes spotted, and sometimes delicately melting into white. One or two have been raised which were pure white, and others white, with clearly marked and distinct spots. They are all half-hardy, only requiring protection from frost; and they should be grown in a compost of equal parts of turfy loam and peat, with a little sand. They all require a good deal of water, as even the little hardy shrubby-kind, *C. rugòsa*, with small, dark yellow flowers, will flag, if water should be neglected even for a single day. The herbaceous kinds are still more susceptible in this respect, and when grown in pots, should stand in saucers of water; the water being changed every day, and never given to them till it has been warmed by standing for a little time in the same temperature as the plants.

Calceolarias are propagated by cuttings, which strike readily in the same soil as that in which the plants are grown; and which do not even require the aid of a bell-glass, though they will certainly strike sooner under one than without. The seeds ripen in great abundance, and they should be sown as soon as they are ripe. The young plants should be pricked out as soon as they come up, and then transplanted into larger and larger pots, increasing gradually in size, and each being only a little larger than the preceding one, till they begin to show flower-buds; and when thus treated, they will flower the following summer. When the seeds are not sown till spring, they will not flower till the second summer. There is only one annual Calceolaria, *C. pinnàta*, and it is not worth growing.

Cale'ndula.—*Compósitæ.* — The Marigold. There are several handsome species, some of which are shrubby, and some annuals; the common Marigold, *C. officinàlis*, and its varieties, and *C. stellàta*, are the handsomest of the annual species. The Cape Marigolds, *C. pluviàlis* and *C. hýbrida*, have been removed by Professor De Candolle to a new genus, which he calls *Dimorphòtheca*. Both these species are hardy annual plants, with very elegant flowers, which close at the withdrawal of the sun; and, as they do not open at all, when dark heavy clouds foretell the approach of rain, Linnæus called the commonest species *Caléndula pluviàlis*, or the rainy Marigold. The florets of the ray of the flowers of this plant are of a pure white inside, and of a dark purple on the outside; while those of *C. hybrida* are of a dingy orange outside.

Californian Annuals.—Beautiful annual plants, mostly sent home by Douglas, and natives of California, on the north-west coast of North America. They all bear cold much better than they do heat; and they will live through the British winters in the open air without any protection, though they are easily killed by the heat of summer, particularly if their roots become by any chance exposed to the full rays of the sun. The roots are indeed very feeble, particularly at the collar, where most plants are strong; and they will die in a few hours if the sun strikes this vital part. Nature has provided against this danger, by giving most of these plants a trailing habit, and thus covering the roots with abundance of leaves and stems: but cultivators, not being aware of the use of this, often, by training their plants over a frame, &c., expose the collar, and thus kill their plants. For the mode of sowing, &c., see Annuals.

Calla.—See Arum.

Callichro'a. — *Compósitæ.* —*C. platyglóssa*, the only species known, is a showy Californian annual, with golden yellow flowers, requiring the usual treatment of Californian annuals.

Callio'psis.—*Compósitæ.*—Every one knows the beautiful plants which compose this genus under their old name of Coreopsis; from which genus they have been separated on account of a slight difference in the internal structure of the flower. The new and old names have some resemblance in point of sound, but they are very different in origin, for Coreopsis is derived from the Greek word *koris*, a bug, from the resemblance of the seeds to that insect; while Calliopsis is from *kallistos*, signifying most beautiful. The species are hardy annuals and perennials; the former of which may be sown in autumn, as they will stand the winter without any protection, and will thus come into flower early in summer. All the species will grow in any common soil; and the perennial kinds are propagated by division of the root. *Calliópsis bícolor* is the same as *Coreópsis tinctòria.*

Calliste'ma.—One of the botanic names for the China Aster.—See Callistephus.

Calliste'mon. — *Myrtaceæ.* — Australian shrubs, with evergreen leaves and tassel-like flowers, better known by their old name of Metrosideros. They should be grown in sandy loam; and cuttings of the old wood strike freely in sand under a bell-glass.

Calliste'phus, *Dec.*—*Compósitæ.*—The China Aster, which is now known by botanists under this name, is one of the most ornamental annuals in British gardens. There are many varieties, and those known as the German Asters are considered the most beautiful. They should be raised on a hotbed in February or March, pricked out when the plants have two or three leaves, and transplanted into the open garden in May, where they will make a very fine appearance in September and October. They should be grown in light rich soil, or in loam and thoroughly rotten dung.

CALLU'NA, *D. Don.*—The common Heather or Ling.—See E'RICA.

CALOCHO'RTUS. — *Tulipàceæ.* — Californian bulbs with splendid flowers, but rather difficult of culture. They require a very sandy soil, which should be covered with litter in frosty weather, if the bulbs are not taken up as soon as they have done flowering in autumn. They produce their large lilac and white flowers in August and September, and occasionally ripen a few seeds, by which, or by offsets, they may be increased slowly.

CA'LTHA.—*Ranunculaceæ.*—The Marsh Marigold.

CALYCA'NTHUS.—*Calycanthàceæ.* Deciduous shrubs from North America, with dark brownish purple flowers, remarkable for their fragrance, as well as their rich colour. The plants thrive best in loam and peat, but they will grow in any soil that is not very stiff and moist; and they are commonly propagated by layers. Most of what are called different species, are only varieties of *C. flóridus*, the American Allspice-tree. The scent of the flowers is commonly thought to resemble that of ripe fruit. *Calcanthus præcox*, the Japan Allspice, is now called by De Candolle, *Chimonánthus fràgrans*, or the winter flower, as it produces its flowers about Christmas.—(See CHIMONANTHUS.)

CALYSTE'GIA.—*Convolvulaceæ.*—The new name for the common hedge Convolvulus, and some other species from America resembling it. The red variety of *C. sèpium*, commonly called the American Convolvulus, makes a very pretty covering for a bower. They grow best in sandy or gravelly soil.

CAME'LLIA.—*Ternstræmiaceæ.*—Evergreen shrubs with splendid flowers, from China, of which *C. japónica*, and its numerous garden varieties, are in general cultivation in all the greenhouses of Europe and America. Some of the varieties, as for example, *C. j. variegàta*, the variegated red, are so hardy as to stand the open air, either as standards, or planted against a wall; particularly if their roots are protected during frosty weather. It is a curious fact, that many tender and half-hardy plants will grow freely, and produce abundance of flowers, if their roots and collars are protected; in a temperature that would kill them immediately, if these tender parts were exposed to the influence of the cold. Thus, when Camellias are planted out, if the roots are protected during winter, by mulching, (that is, covering with straw or litter), and the trunk of the bush is wrapped round for about six or eight inches from the ground, with a hayband, or any other covering, the rest of the plant may be left entirely exposed without its sustaining the slightest injury. Camellias are commonly cultivated in sandy loam and peat, and this soil is perhaps the best for them when they are grown in pots; but when they are planted out in a conservatory, or the open ground, they will thrive exceedingly well in sandy loam, mixed with rotten dung, or leaf mould. When the plants are in a growing state, they require abundance of water, both at the roots and over the leaves; taking care, however, never to wet the leaves when the sun is shining upon them; as wherever this occurs, the leaves become stained, or blotched, and look as though they were scalded. When Camellias are kept in a greenhouse or conservatory, imperfections in the glass will produce the same effect. The temperature of the Camellia house should be between fifty and sixty degrees during the growing season; but when the flower-buds are formed, it may be lower, till the beginning of winter, when the buds begin to swell. At this season the temperature ought not to be suffered to fall below fifty degrees, otherwise the buds will be liable to drop off; and they will also drop, if watering be neglected. All the species and varieties may be propagated by cuttings, taken off at the base of a leaf, or at a joint, as soon as the wood is ripened, and planted in sand under a glass; but the finer varieties are generally propagated by layering, and inarching, or grafting. The French nurserymen have a very rapid mode of procuring plants by grafting, which they effect under bell-glasses, in strong moist heat, with scions of the young wood, on stocks formed of cuttings struck the same season. From the Camellia being an evergreen, and its leaves being large, dark-green, and shining, it makes a very fine appearance against a conservative wall; and no plant whatever is more magnificent in a conservatory. It must be observed, that all the varieties of *C. japónica* cannot bear too much heat, and they prefer the shade to broad sunshine; also that when they are planted against a wall, it is better with a south-east aspect than full south. *C. Sasánqua,* and its beautiful variety, *C. S. maliflòra,* are the most tender.

Campa'nula.—*Campanulaceæ.*—Beautiful herbaceous plants, natives of Europe and Asia; the greater part of which are perennials, and are hardy in British gardens. There are also some handsome hardy biennials and annuals, and one or two greenhouse species. Many of the hardy perennials are dwarf plants, which produce a profusion of flowers, more conspicuous than the leaves; which renders them particularly adapted for rockwork, or growing in pots. Some of the species are so tall, as to require to be planted at the back of borders, or in a single row, along with other tall plants; such, for example, as *C. pyramidàlis*, the pyramidal bell-flower; *C. Trachèlium,* the throat-wort, &c. *C. pyramidàlis,* is one of those plants that by repeated re-potting, can be brought to an extraordinary size, either as a narrow cone covered with deep blue flowers from the base to the summit, or trained against a frame in the fan manner. By either mode it makes a very splendid object; and all the art required to produce it, consists in employing rich soil, and in shifting the plant for two years into pots always a little larger and larger, so as to prevent it from coming into flower till it has acquired extraordinary vigour. Some of the prettiest little species for pots, or rockwork, are *C. cenísia,* and *C. uniflòra,* which do not exceed three inches in height, and are covered during June or July with blue flowers; *C. carpáthica, C. rotundifòlia, C. gargánica,* and upwards of fifty others, which do not exceed six inches in height. All these are very valuable for forming beds in a geometric or regularly-shaped flower-garden, from their dwarf and compact habit of growth, and from the great profusion of their leaves and brilliant-looking flowers. *C. mèdium,* the Canterbury Bell, is one of the most ornamental of biennials; and *C. spéculum,* Venus's Looking-glass, is a well-known and pretty annual. This last species has been, however, twice removed from the genus Campanula; having been called *Prismatocárpus Spéculum,* by L'Heritier, and *Speculària Spéculum,* by De Candolle. The new Venus's Looking-glass of the nurseries, *Campánula Lorei,* has, however, been always considered to belong to Campanula. All the species grow freely in any common soil, and are increased by dividing the roots, or by seeds. The roots of all the species are eatable.

Campion.—See Silene, or Lychnis.

Candleberry Myrtle.—See Myri'ca.

Candytuft.—See Ibe'ris.

Ca'nna, *L.*—*Canneæ*, or *Scitamineæ*.—Splendid reed-like plants, from the East and West Indies, and South America, of which two species, *C. pàtens* and *C. speciòsa*, are sufficiently hardy to stand the winter at the base of a south wall, where they will flower freely during summer. The common Indian shot, *C. índica*, and almost all of the other kinds, require a stove. They are all grown in rich light soil, and are readily increased by dividing the roots, or by seeds. The seeds of the hardy kinds generally require to be steeped in water before they are sown. They should then be raised on a hotbed, and shifted two or three times before they are planted out.

Canterbury Bells.—See Campa'nula.

Cantua, W.—See Gilia and Ipomopsis.

Cape Bulbs are remarkable for the beauty of their flowers; and as they occupy but little space, a considerable collection of them may be grown in a very small garden, in a great measure without the aid of glass. The situation should be exposed to the south, and protected from the north; and the soil should consist of sand and peat, or sand and leaf mould, to the depth of two feet, thoroughly drained. In such a bed, all the Cape Iridaceæ may be planted, placing the bulbs not less than six inches below the surface of the ground, and protecting the plants when they come up with a mat; and after they die down, covering the bed with rotten tan, rotten leaves, or litter. No other plants ought to be planted on the bed during the summer, nor any water given to it during winter, lest the bulbs should be rotted. If there is a sufficient length of wall, with no trees planted against it; as, for example, the front wall of a pit or hothouse, the best mode is to make the bed not more than two or three feet in width; by which means it may be easily and effectually protected by shutters, made to rest on the ground on one edge, and to lean against the wall on the other. When there is no such wall, a very good mode of affording protection during winter, is to surround the bed with a wooden frame, or a brick or stone wall; and either to cover it with glazed sashes, or oiled canvass, in frames, or with boards, or mats; taking care always to uncover the bed in fine weather.

Cape Jasmine.—See Garde'nia.

Cape Phyllyrea.—*Cassìne capénsis*, *L.*—A low, half-hardy shrub, allied to the holly.

Cape Shrubs in their native country grow chiefly in very sandy soil, mixed with vegetable mould, formed by the decay of the same shrubs which it nourishes. The best imitation of such a soil in British gardens is sandy loam, which ought to be well drained, by putting crocks or potsherds in the bottom of the pots, to the depth of an inch or two; and afterwards covering them with turfy peat, to prevent the soil from being washed through the crocks. In the management of Cape shrubs, the great art is, to keep them uniformly moist; but never very wet, and never so dry as to cause the plants to droop their leaves. If ever they are allowed to droop their leaves for three or four hours, death is almost the certain consequence; and this is the reason why so many Cape heaths are killed by those who will not take the trouble to water them regularly. To lessen the risk of destruction by drought, some cultivators have an outer and inner pot; the object of the former being to lessen the evaporation from the latter. Others mix lumps of free-stone with the soil in the pots; and these being powerful absorbers of moisture, retain, as it were, a reserve of water for the plant to have recourse to, when it is neglected by the gardener. It may be useful to observe, that when peat, or a mixture of sand and peat, in a pot where the soil has become matted with roots, is once thoroughly dried, it is extremely difficult to moisten it again properly; and hence, many persons, who pour water on the surface of pots containing plants in sandy peat, imagine that it penetrates the ball of earth and roots, while, in fact, it very frequently escapes between the ball and the pot, moistening only the outer surface of the ball, and leaving the great mass of roots in its centre quite dry. Perhaps as many Cape heaths and shrubs, and Australian shrubs, are killed in this way, as geraniums and bulbs are killed by over-watering. —See Eri'ca.

Ca'pparis.—*Capparídeæ.*—A genus of rambling shrubs, natives of both the East and West Indies, and of South America. One species, *C. spinòsa*, the common Caper, grows wild in the south of Europe, and forms in England a greenhouse trailer, as well as a most suitable plant for a conservative wall, remarkable in both situations for the beauty of its flowers. It grows in common soil, and is readily propagated by cuttings of the roots.

Caprifo'lium.—*Caprifoliaceæ.*—The Honeysuckle. Well-known climbing plants, remarkable for the delightful fragrance of their flowers. *C. itálicum*, the Italian Honeysuckle; *C. Periclýmenum*, the common Woodbine, and its varieties; and *C. sempervirens*, the Trumpet Honeysuckle, are those most common in collections. The beautiful and very fragrant plant generally called *Lonícera flexuòsa*, Bot. Reg., is sometimes found under the name of *Caprifolium chinense;* and the gold and silver Honeysuckle is generally called *C. japonicum.* Both these plants are natives of Japan and China, and they are rather tender in British gardens. They should be grown in a soil composed of sand, peat, and loam, and are propagated by cuttings. The Trumpet Honeysuckle, and *C. flavum*, Bot. Mag., should also be grown in sandy peat, and require a slight protection in severe weather; but all the other kinds may be grown in common soil, without any further care than training them against a wall, or over paling.

Ca'psicum.—*Solanaceæ.*—The pods of the plants belonging to this genus produce the Cayenne pepper; and they are very ornamental from their brilliant colour, which is a bright scarlet, and their remaining on all the winter. They are generally tender annuals, requiring the heat of a stove to ripen their fruit; but there is one species, *C. cerasiforme*, sometimes called Cherry Pepper, or Bell Pepper, which does not require any greater heat than that of a greenhouse.

Carda'mine.—*Cruciferæ.*—Low herbaceous plants, natives of Europe, and of which *C. praténsis plèna*, the Cuckoo Flower, or Lady's Smock, and one or two other species, deserve a place in the flower garden. *C. trifòlia* is valuable for its early flowering, and, with several other species, is well adapted for pots or rockwork. Common soil, kept moist.

Cardinal-flower. See Lobe'lia.

Ca'rex.—*Cyperaceæ.*—The Sedges are well-known British and American plants, of which only one species, *C. Fraseriàna*, Ait., a native of America, deserves a place in the flower-garden. It grows about half a foot in height, has broader leaves than the common Sedges, and produces its large white flowers, which look like little lilies, from April to June. It requires a moist loamy soil, or to be grown in a pot, and kept in a pan of water.

Carnation.—See Dia'nthus.

Carob tree.—See Ceratonia.

Caroli'nea. — *Bromeliáceæ.* — Splendid tropical low trees, one of which, *C. insígnis*, occasionally flowers in British stoves. It requires a rich loamy soil, and plenty of space; and it may be propagated by cuttings with the leaves on, in sand under a glass, and plunged in heat.

Ca'rthamus. — *Compósitæ.* — Hardy annuals. *C. tinctòrius*, the Bastard Saffron, is an old inhabitant of British gardens, and it only requires sowing in the open air in March or April. From the dried flowers of this plant is made what is called vegetable rouge. *C. lanàtus*, L., the Distaff Thistle, is now called *Kentrophýllum lanàtum* by De Candolle.

Ca'ssia. — *Leguminosæ.* — The Senna tree. Only a few of the species are from temperate climates, and among these, *C. corymbòsa*, Lam., is a very showy greenhouse shrub, with yellow flowers; and *C. marilándica*, from Maryland, is a perennial herbaceous plant of easy culture in the open garden. All the ligneous species are readily propagated by cuttings, and the others by seeds or division of the roots.

Castille'ja.—*Scrophulárinæ.*—The American Painted Cup. *C. coccinea* Sprengel, *Bartsia* L., *Euchroma* Nut., is a hardy annual, with yellow flowers and scarlet bracteas, which only requires sowing in March or April in the open ground.

Cata'lpa.—*Bignoniàceæ.*—Deciduous trees, one of which, *C. syringæfolia*, Bot. Mag., is quite hardy in British shrubberies, in which it richly deserves a place on account of its splendid flowers. It will grow in any common soil that is tolerably dry; but if it has too much moisture, the shoots, which are naturally soft, with a large pith, will never be thoroughly ripened. For the same reason, the situation ought to be airy. It is propagated by seeds, or cuttings of the roots.

Catana'nche.—*Compósitæ.*—Herbaceous plants, natives of the south of Europe. *C. cærulea* is a perennial; *C. bicolor*, is a biennial; and *C. lutea*, an annual. All the species have pretty flowers, but are rather awkward-looking plants, from their long and very slender flower-stalks. They are of easy culture, but grow best in poor gravelly soil.

Catchfly.—See Silene.

Caterpillars. — The larvæ of moths and butterflies, and very destructive to vegetation. Many gardeners keep their gardens clear by destroying the female butterflies and moths before they have laid their eggs (see Butterfly and Moth); and others by carefully searching for the eggs early in spring, when the trees are without leaves. When these preventive measures have been neglected, the only effectual way to prevent the ravages of caterpillars is to pick them off the trees separately. The visits of caterpillars are very uncertain, and some seasons they are much more abundant than in others. Sometimes the caterpillars of the Magpie Moth will entirely strip the gooseberry bushes of their leaves, and the fruit will, in consequence, become tough and insipid; and in other seasons, the caterpillars of the Lackey Moth, the Hawthorn Butterfly, and the Ermine Moth, will strip the hawthorn and flowering shrubs. In all these cases hand-picking should be resorted to as soon as the insects are perceived. Many persons recommend fumigating with tobacco smoke, or by burning wet straw under the tree; and others, washing with tobacco or lime water; but most of these remedies are worse than the disease.

Catmint.—See Nepeta.

Cattle'ya. —*Orchidaceæ.*— Orchideous plants, with large and splendid flowers, natives of South America. They may be grown either in pots in peat mixed with lime rubbish; or on pieces of wood or cocoa husks hung up in a hothouse, the roots being wrapped in wet moss. All the species of Cattleya are easily propagated by dividing their roots; and they are particularly valuable, as they will thrive in a common hothouse if well supplied with water, without requiring the excessive heat and moisture generally necessary for the tropical Orchideæ.

Ceano'thus.—*Rhamnàceæ.*—Red root. American hardy and half-hardy shrubs, with large spikes of very small flowers. The most ornamental species of the genus is *C. azùreus*, which is only half-hardy in the climate of London, requiring protection from severe frosts. *Ceanòthus pállidus* is much hardier than *C. azùreus*, and strongly resembles that species; but its leaves are not hoary beneath, and its flowers, Dr. Lindley tells us in the Bot. Reg., "are smaller, as well as much paler." He adds, that it is often confused with *C. ovàtus*, which "is a mere variety of *C. Americàna*," and *C. thrysifòlius*, which "is a Californian tree, with deep blue flowers, and very strongly angular branches." *C. Americànus* is the least ornamental of all the kinds; and *C. collìnus* is a dwarf plant, not above two feet high, with a profusion of white flowers. The last two are quite hardy, *but the other* kinds should be trained against a south wall, and protected from severe frosts by a thatched coping. They should all be grown in a compost consisting of three-fourths of heath mould, or a mixture of sand and peat, with one of loam, and the soil should be well drained. The best way to effect this, as the plants are generally grown in the open air, is to dig a pit for each, about two feet deep, and a foot and a half or two feet in diameter, and to fill about a third of it with broken brickbats, pieces of freestone, and pebbles. The compost should be put on this, and raised a few inches above the level of the general surface of the garden to allow for sinking. This plan will not only ensure drainage, and thus prevent the roots from being injured with wet; but the broken bricks and pieces of stone will provide a reservoir of moisture which will equally serve to prevent the roots from ever becoming too dry.

Cedar of Goa.—*Cupressus lusitanica*, Tou.; *C. glauca*, Lam. A very ornamental half-hardy tree, which in a sheltered situation has a beautiful effect on a lawn, from its drooping branches and glaucous foliage. It requires a light soil, and to be occasionally watered, as its roots are very apt to wither if suffered to become too dry.

Celandine. See Chelidonium, and Ficaria.

Celo'sia. — *Amaranthaceæ.* — Tender annuals, with showy flowers. The common Cockscomb, *C. cristàta*, may be grown to a very large size by raising the plants on a hotbed, and frequently shifting them into longer and larger pots, as directed for the balsam (see Balsaminia).

Cela'strus, L. —*Celastrineæ.* — The Staff tree. Half-hardy shrubs, mostly natives of the Cape, with white flowers. For culture, see Ceanothus.

CELSIA.—*Solanaceæ*, or *Verbascinæ*.—Half-hardy annuals and biennials, with showy yellow flowers, and nearly allied to the genus Verbascum. They are generally raised on a hotbed, and the biennials are kept in the greenhouse during winter, as they are killed by a slight frost. *C. linearis*, and *C. urticæfolia*, with scarlet flowers, are now included in the genus Alonsoa.

CENTAUREA.—*Compósitæ*.—The common perennial species are known by the English name of Knapweed; and the only quite hardy annual one, *C. Cyanus*, by the name of Corn Bluebottle. The most beautiful species, *C. Crocádylium*, L., is a half-hardy annual, which should be raised on a hotbed, and planted out in May. *C. benedicta*, L., *Cnicus benedictus*, Dec., the Blessed Thistle, is a hardy annual, which may be sown in March or April, and will flower all the summer; and *C. suaveòlens*, and *C. moschàta*, L., the yellow and purple Sweet Sultans, have been formed into the genus Amberboa by Professor De Candolle.

CE'RASUS.—*Rosàceæ*.—The Cherry. Hardy trees and shrubs, for the most part deciduous, and all more or less ornamental on account of their flowers. The common double Cherry, and the French double Cherry, deserve a place in every garden; and equally so do the Chinese Cherry, *C. Pseudocérasus;* the All-Saints Cherry, *C. semperflòrens;* the Bird Cherry, *C. Pàdus;* the Virginian Bird Cherry, *C. virginiana*; the Mahaleb Plum or Cherry, *C. Mahá-leb;* and the Japan Cherry, *C. japónica*, known in the nurseries as the double Dwarf Almond. Many of the plants here enumerated are known at some of the nurseries by the name of Prunus; as *P. Mahaleb*, *P. Padus*, *&c.;* but in others they are called *Cerasus*. It is necessary to know this to avoid buying the same plant under different names. All the species grow in common soil, and are propagated by grafting or seeds. The common Laurel, *Cerasus Laurocerasus*, and the Portugal Laurel, *Cerasus lusitánica*, which also belong to this genus, have showy spikes of flowers, and deserve culture on that account, independently of their shining evergreen leaves.

CERATO'NIA.—*Leguminosæ*.—An evergreen greenhouse shrub, a native of the south of Europe and Asia. The pod is fleshy, like that of the tamarind, and it is said to have been the food St. John fed on in the Wilderness, the seeds being called "locusts," and the pulp "wild honey." Hence the popular name of St. John's bread. It is also called the Carob tree. The tree is of very slow growth, and the flowers have no beauty; but the plant is worth cultivation for its dark green leathery leaves. It should be grown in a mixture of equal parts of loam and peat, well drained, and frequently watered; and it is propagated by cuttings of the old wood stuck in sand.

CE'RCIS. — *Leguminosæ*. — The Judas tree. Few trees are more ornamental in a shrubbery than the two species of this genus; but *Cércis Siliquástrum*, the common kind, is decidedly the handsomest. The leaves are curiously shaped, and the flowers, which are of a beautiful pink, grow out of the bark of the stem, and branches, and not like those of other plants, among the leaves. These flowers have an agreeably acid taste, and when fried in batter make excellent fritters. The common Judas tree is a native of the Levant, and it is frequently grown against a wall, producing its flowers in April; but the American kind, *C. canadénsis*, is quite hardy. They both produce abundance of seeds, and grow best in a deep sandy loam, rather rich than poor.

Ce'reus.—*Cactaceæ.*—The Torch Thistle. One of the genera into which the Linnæan genus Cactus is now divided. This genus was first formed by Mr. Haworth, who made it consist only of all the cacti that had long angular or round stems; but modern botanists include in it those of the short round-stemmed porcupine cacti, that have long tube-shaped flowers. Of the true kinds of Cereus, which are still generally the only ones known by that name in most private collections and nurseries, the best known are *C. speciosissimus*, the crimson-flowered Torch Thistle, and its hybrids and varieties, the stems of which are erect and angular, and the flowers dark crimson, *C. flagellifórmis*, the Creeping Cereus, the long round stems of which hang down like cords, and the flowers of which are pink, and *C. grandiflorus*, the Night-blowing Cereus, the flowers of which are white and yellow. The Old Man's Head, or Monkey Cactus, *Cèreus senìlis*, is also becoming tolerably well known. All the kinds of Cereus only require greenhouse heat; they should all be grown in loam mixed with pounded brick and lime rubbish, in pots well drained with cinders; and they all require abundance of air and light. It is best to give them a season of rest when they have done flowering; and this is done by removing them to a colder house, and withholding water. If, however, they are continued in the same house in which they were flowered, the supply of water should be only lessened, and not stopped entirely. In other respects their culture resembles that of the other Cacti (see Cactus).

Ceri'nthe.—*Boragineæ.*—Honeywort. Hardy annuals, more curious than beautiful, that will grow in any soil or situation; and which, if sown in spring or summer, will generally come into flower in about six weeks from the time of sowing; and if sown in autumn, will stand through the winter.

Chalk. Carbonate of lime (see Earths).

Chamæmoly.—A species of Allium.

Chamæbuxus. See Polygala.

Chardi'nia. The new name for *Xerànthemum orientàle.*

Charlwoo'dia.— *Asphodèleæ.* — Stately plants, nearly related to *Dracæna,* the Dragon tree, growing well in a mixture of light loam and sandy peat, and requiring a cool part of the stove, or a very warm greenhouse. *C. congésta* has pale blue flowers, and is readily increased by cuttings planted under a hand-glass, without shortening the leaves.

Chaste Tree.— *Vitex Agnus Cactus*, a low shrub of no beauty, which will grow in any common soil.

Cheira'nthus.—*Crucíferæ.*—The wall-flower. Well known herbaceous plants, which are much prized for the delightful odour of their flowers, which are produced from April to July. *C. Cheìri*, the common wallflower, and its varieties, both double and single, are in general cultivation, growing in any common soil; and the varieties are readily increased by cuttings. The best varieties are the double blood, the double striped, the double yellow, or Polish, and the double purple, all of which may be obtained from the nurserymen. *C. alpìnus* is a pretty hardy little plant, with yellow flowers, well suited for growing in pots, or on rock-work. *C. mutábilis* is a curious species from Madeira, requiring the greenhouse, and flowering from December to May.

Chelido'nium.—*Papaveràceæ.*—The common Celandine, or *C. Màjus*, Swallow-wort, is a hardy perennial, with yellow flowers, common on the sea-coast, and in churchyards, in many parts of England. It grows in any common soil, and is readily increased by division of the roots, or by seeds, which it produces in abundance.

Chelo'ne. — *Scrophulárineæ.*— Handsome herbaceous plants, natives of North America, most of which are, however, now included in the genus Pentstemon. The four still called Chelone, are *C. glabra, C. obliqua, C. Lyoni* (*C. major*, Bot. Mag.), and *C. nemorosa.* All the species grow freely in light rich soil, and are readily increased by cuttings, suckers, or seeds, which in favourable seasons are produced in abundance.

Chermes, or *Kermes.*—A scale-like insect that raises a kind of gall apple on a species of oak (*Quércus coccífera*), and which produces a brilliant scarlet dye. The true Chermes is a kind of coccus; but the name was applied by Linnæus to a genus of leaping insects known by the popular name of false aphides, because the larvæ resemble those insects; though in their perfect state, they have red bodies, and long snow-white wings. These insects, which are now called Psylla, are generally found on plants of the genus *Pyrus;* and they may be known to have attacked a tree by the curling up of its leaves, and withering of its branches. They frequently attack the *Pyrus* or *Cydònia japónica*, and the snowy Mespilus, which they destroy by sucking the sap out of the branches. The only way to get rid of them is to wash and brush the branches with soft soap and water in winter and spring.—See Aphis.

Cherry.—See Cerasus.

Cherry Bay and Cherry Laurel.—Old English names for the common Laurel.

Chimona'nthus. — *Calycánthеæ.* — *C. fràgrans*, the winter flower (*Calycánthus præcox*), and its varieties, are well deserving a place against a conservative wall, or in the conservatory; for though hardy enough to stand our winters in the open air, yet from their very fragrant flowers being produced in December, January, and February, they are very liable to be injured by the frost. They thrive in almost any soil, but prefer a mixture of loam and peat. They are readily increased by layers, and cuttings of the young wood, which, planted in sand under a bell-glass, strike freely. The large-flowered variety has darker and handsomer flowers, but they are less fragrant.

China Aster.—See Callistephus.

China Rose.—See Rosa.

Chinar Tree.—The Oriental plane.

Chinquapin.—Dwarf Chestnut.

Chiona'nthus.—*Oleìnæ.*—*C. virginica*, the Fringe Tree, is a large shrub, well deserving a place in all peat borders, both for the beauty of its white fringe-like flowers, and for its leaves, which are often as large as those of Magnòlia grandiflòra, and die off of a fine rich yellow. It is readily increased by layers or seeds, and it may also be grafted or budded standard high on the common ash, when it will form a fine object for a lawn, or for the centre of a flower-bed.

Chiro'nia.—*Gentiàneæ.*—Greenhouse plants of short duration, and consequently requiring to be frequently raised from cuttings, which strike freely in peat under a hand-glass. *C. frutéscens*, with rose-coloured flowers, and its variety, with white flowers, are the most desirable species, and may be easily procured from the nurseries. They are also frequently raised from Cape seeds, the plants being all indigenous at the Cape of Good Hope.

Choro'zema. — *Leguminòsæ.* — Beautiful New Holland shrubs, thriving well in an equal mixture of loam, sand, and peat. They are readily increased by cuttings in sand under a bell-glass, or by seeds, which are frequently ripened in abundance. All the species are worth cultivating; and they are interesting, not only for their beauty, but for their name. Labillardiere had been wandering in New South Wales for several days in great distress for water, all the springs he found being too brackish to drink; when, at last, he and his companions found a fresh-water spring. Near the spring grew some of these plants, which Labillardiere named Choro'zema, from two Greek words, signifying to dance with joy from drinking.

Christmas Rose.—See Helle'borus.

Christ's Thorn.—See Paliurus.

Chrysa'nthemum.--*Compósitæ.*—*C. sinénse*, the Chinese Chrysanthemum, and its varieties, are well known, and have, for many years, attracted the attention of the cultivator, on account of the great variety of their showy flowers, which are produced from October to December. They grow freely in any light rich soil, and are readily increased by suckers, division of the roots, layers, and cuttings, which flower the same year they are struck; and they are some of those plants that derive great advantage from frequent shifting. When this is neglected, the stalks are apt to become long and weak, with few or no branches; and as the flowers are always terminal, they are consequently few also. Taking off the points of the shoots will make the plants bushy, but it will have a tendency to prevent their flowering; but repeatedly changing the pots always into one only a little larger, will not only make the plants bushy, but induce them to flower abundantly. When this mode of culture has been neglected, the Chrysanthemums should be planted against a wall, or pegged down over a bed in the flower-garden; and by slightly protecting them during frosty nights, they will frequently continue in flower till January or February. The varieties are continually changing, new ones being raised every year; but nearly all the kinds may be classed in one or other of the following seven divisions,—the Ranunculus-flowered, the Incurved, the China Aster-flowered, the Marigold-flowered, the Clustered, the Tasseled, and the Quilled. The best annual Chrysanthemums are *C. tricolor*, L., (*C. carinàtum*, Schou.,) with white, yellow, and purple flowers, and *C. coronàrium*, L., with yellow flowers, both of which are quite hardy, and well worth a place in the flower-garden. Seeds may be procured from all the seedsmen.

Chryso'coma. — *Compósitæ.* — Goldy-Locks. Low soft-wooded shrubs from the Cape, with yellow flowers. They thrive well in a mixture of loam and peat, and are readily increased by cuttings. The herbaceous plants which were formerly included in this genus, are now removed to the genera *Linosyris*, *Euthamia*, and *Bigelovia*. These are all natives of North America, and all hardy perennials, which will grow in any common soil, and are speedily propagated by division of the roots.

Chryse'is.—See Eschscholtzia.

Chrysosple'nium. — *Saxifrágeæ.* — Golden Saxifrage. Herbaceous plants, with yellow flowers, natives of Britain, North America, and Nepal, not growing more than 4 or 5 inches high. They are rather difficult to cultivate, but succeed best in a moist shady situation, near a rivulet, or at the foot of rock-work, or in a grotto. They should be grown in a mixture of loam and peat, and are propagated by division of the roots.

Chymoca'rpus.--*Tropæ'oleæ.*—*C. pentaphýllus* is the new name for *Tropæ'olum pentaphýllum*. The general appearance of the plant resembles that of Tropæolum tricolo-

rum, but when examined closely, the flowers will be found to differ in their construction, and in the number of the little inner petals, which are five in Tropæolum, and only two in Chymocarpus. The root of the first also somewhat resembles a potato, and that of the last a carrot. *Chymocarpus pentaphýllus* is a beautiful climbing plant from Buenos Ayres, growing freely in sandy peat and loam, in the open air, if planted against a south wall. It grows very rapidly, and produces a profusion of red and green flowers during the whole summer, which, should the autumn be favourable, are succeeded by a number of black juicy berries, which, in flavour and appearance, are not unlike the Zante grape. It grows freely from seeds, if sown in a gentle heat immediately they are ripe, and may be increased by cuttings, or division of the roots. When it is grown in a pot, care must be taken not to over-water it, when the stems have died down in the autumn. When trained over a wire frame, it makes a splendid show when in flower, or fruit.

Cincho'na.—See Lucu'lia.

Cinera'ria. — *Compósitæ.* — The Cape Aster. The half-shrubby plants belonging to this genus are all of easy culture, and hybridize freely with each other; and when it is added that they produce a great abundance of showy flowers, it will not appear surprising that they are in general cultivation. They are nearly hardy, but are always grown in pots, as they flower so early in the season, that in the open ground their flower-buds would be liable to be nipped by frost. They are grown in light rich soil, and only require ordinary attention in watering. They are propagated by dividing the roots in August, by cuttings struck in autumn, or by *seeds, which* they ripen in abundance. The seed should be sown in May, on a slight hotbed, and the young plants pricked out into small pots, and shifted frequently during the summer. If they are wanted to flower in December, they should be kept in the greenhouse all the year, and they will begin to throw up their flower-stalks in October; but if they are not wanted to flower before April, the usual time of their flowering, they may stand in the open air, and need not be shifted above three or four times during the summer; and in October they may be put into a cold pit, where they may remain, just protected from the frost till March, when they will begin to send up their flower-stalks. Nearly all the beautiful purple-flowered kinds are varieties of hybrids of ***C. cruénta,*** a native of the Canaries. The finest hybrids are ***C. Waterhousiana, C. Hendersonii,*** and the kind called the King.

The herbaceous species of Cineraria have nearly all yellow flowers, and many of them are natives of Europe. They should be grown in rather light soil, and they are propagated by division of the root. *C. aúrea*, with golden yellow flowers, a native of Siberia, is one of the handsomest species. Professor De Candolle, in his late arrangement of the Compositæ, has removed most of the plants formerly included in the genus Cineraria, to Senecio.

Circæ'a.—*Onagraceæ.*—Enchanter's Nightshade. A pretty little British plant, growing in any soil and situation.

Ci'stus. — *Cistineæ.* — The Rock Rose. Beautiful hardy and half-hardy shrubs, which grow freely in a mixture of loam and peat, and are readily increased by cuttings planted under a hand-glass, layers, or seeds, which are ripened in abundance. Most of the species are of low growth, and are generally used for rock-work;

but some are tall handsome shrubs, such as the Gum Cistus (*C. cýperius* and *C. ladaníferus*), and the purple-flowered Cistus (*C. purpùreus*). The dwarf kinds being generally rather tender, will require a slight protection during severe winters, when they are planted out on rock-work.

Ci'trus, L.—*Aurantiaceæ.*—The genus Citrus includes oranges, lemons, limes, citrons, shaddocks, &c., all well deserving cultivation, both for their flowers and their fruit, but of which only a few kinds of oranges and lemons are generally grown. They all thrive well in a mixture of rich loam with a little rotten dung; but great care is necessary not to over-pot them, or give them too much water when not in a growing s'ate. On the Continent, they are indeed frequently kept during winter in a cellar, almost without either light or water, and brought into the open air during summer. The different species and varieties are generally propagated by budding, grafting, and inarching on the common lemon, which grows readily from seed. The best time to do this is in February or March, when the grafts, &c. will take well. and in a very short time; and if grafted on good strong stalks, they will make handsome plants by the autumn. As soon as the grafting or budding has been performed, the plants should be set in a close frame on a moderate hotbed; but not plunged into it, as, from the tenderness of their roots, that might injure them. Oranges are also frequently raised from seeds; but unless they are budded or grafted when about two years old, it will be many years before they flower. Orange trees may also be propagated by cuttings, which are best of the old wood, struck in sand in a gentle bottom heat, and shaded. Plants raised in this manner flower and fruit much sooner than any others, but they scarcely ever attain a large size.

Cla'rkia.—*Onagraceæ.*—Beautiful hardy annuals, with rose-coloured, white, and purple flowers, natives of California, requiring the same treatment as the other Californian annuals. They may, however, be sown in spring; and as, when this is the case, they are apt to become drawn up, the general appearance of the bed is much improved by sowing mignionette with the Clarkia seeds in March or April.

Clary.—See Salvia.

Clay.—(See Earths.)

Clayto'nia. — *Portulàceæ.* — Hardy herbaceous plants, some annual and some perennial, with pretty pink and white flowers, but having rather a weedy appearance. They grow best in a peat border, and are increased by seeds, which sometimes ripen in abundance.

Cle'matis. — *Ranunculaceæ.* — Half-hardy and hardy climbers; shrubby and herbaceous; with white and purple flowers. They are all most desirable plants, of the easiest culture in any light rich soil; and readily propagated by cuttings of the young wood, or seeds, which are frequently ripened plentifully. *C. flórida*, with white flowers; *C. Siebóldtii*, with white and purple flowers, and *C. cærùlea*, with beautiful violet blue flowers, are among the handsomest of conservatory climbers, and when planted out in the open air, with their roots protected, they frequently come into blossom early in March. *C. viticella*, and its varieties, *C. flámmula*, *C. Hendersònii*, and *C. cylíndrica* are all quite hardy, and form most beautiful objects when trained over lattice-work, or baskets in the flower-garden; and no garden, however small, ought to be without one or more of these species.

Cleo'me.—*Capparideæ.*— Splendid stove shrubs, annuals, and biennials, with one or two half-hardy annuals, with white, rose, and purple flowers, of easy culture in any light rich soil.

Clerode′ndrum.—*Verbenàceæ.*—Very ornamental stove shrubs, chiefly natives of the Tropics. They all grow freely in a light rich soil, composed of two parts of loam, one of rotten dung, and one of peat. They require frequent shifting from small pots to larger ones, to make them flower freely. They strike readily from cuttings of the young wood planted under a hand-glass; or cuttings of the roots planted in a pot, with their tops just above the surface of the mould, and plunged in a hot-bed, will root readily. The most desirable species are *C. fràgrans*, with pink flowers; *C. paniculatum* and *C. squamatum*, with scarlet flowers, and *C. macrophyllum*, with white flowers. Several of the species were formerly called *Volkameria.*

Cle`thra.—*Eríceæ.*—Hardy and half-hardy shrubs, with white flowers; of which *C. arborea* forms a very handsome small tree, when planted out in the free soil in a conservatory, or in a sheltered situation in the open air, producing a great profusion of spikes of white flowers from August to October. All the species thrive well in a mixture of loam and peat, and they are all readily increased by layers, cuttings, or seeds.

Clia′nthus.—*Leguminoseæ.*—*C. puníceus*, the crimson Glory Pea, is a magnificent half-hardy shrub, with bright crimson flowers; a native of New Zealand. It grows very freely in rich loam, if its roots are allowed sufficient room; and it generally thrives most when planted against the back wall of a conservatory, or against a south wall in the open air, requiring only the protection of a mat in winter. ttings planted in pots in the autumn, and kept in a shady part of the greenhouse, will be rooted by the spring, when they may be planted in the open border. It is a plant that rarely flowers well in a pot; as it requires abundance of room for its roots, and grows rapidly, with rather succulent shoots, requiring abundance of water during the growing season, and very little at any other time. When grown in the open ground, the juicy nature of its shoots renders it a favourite food for snails; and when kept in the conservatory, or greenhouse, it is very apt to be attacked by the red spider. If these enemies be kept away, and the plant be grown in rich soil, composed of equal parts of loam and thoroughly rotten manure, and well supplied with air, light, and water, with abundance of room for its roots, the rapidity of its growth, and the splendour of its flowers, will almost surpass belief; but unless these points are attended to, the plant is scarcely worth growing.

Climate is the grand regulator of vegetable culture; and the garden and landscape scenery of every country depends far more on the climate of that country than on its soil. In modern times the climates of all other countries are imitated by hothouses; a practice scarcely, if at all, known to the ancients. In imitating a climate, it is not only necessary to attend to temperature, but equally so to light, and, to a certain extent, to the moisture of the atmosphere, and to the motion of the air and its change. Heat is communicated to plant-structures by the decomposition of fermenting substances, and by the combustion of fuel, operating by means of smoke or heated air in flues, or by water circulated in pipes, either in a fluid state, or in an aeriform state, as steam; or by the heat of the sun passing through glass, and heating air which is not allowed to escape. The last mode is never wanting, whichever of the former modes may be adopted. The moisture of the atmosphere in plant-structures is maintained by watering the plants; and by keeping the surface of the ground and floor more or less moistened with water, according to the height of the temperature. The motion of the air is not in general considered of great importance, and is generally only effected in fine days when the house can be opened, and the external air freely admitted; but a mode of heating has recently been invented by Mr. Penn, of Lewisham, by which means a perpetual circulation of air is kept up night and day; and which, independently altogether of its effect on the plants, so lessens the feeling of heat to the human frame, that the temperature of eighty degrees in houses where the air is charged with moisture, is found to be as agreeable as that of sixty degrees, the common temperature of comfortable living-rooms.

Climbing Plants are those plants that raise themselves from the ground by attaching themselves to whatever objects may be near them. One class of climbers attach themselves by tendrils, such as the vine, and the passion flower; others by the footstalks of leaves, as in the nasturtium, and some species of clematis; another class twine their stems round objects, such as the convolvulus; while some attach themselves by small root-like bodies, such as the common ivy, and the Ampelópsis, or Virginian creeper; and others raise themselves by ascending through other plants, such as the common nightshade in hedges, or the plant called the Duke of Argyle's tea-tree, *Lýcium bárbarum*. The twiners may be supported by single rods; but all the others, excepting those which support themselves in the *manner of the ivy*, require branched stakes, such as the sticks put into rows of peas; while plants of the nature of ivy, require a wall, a rock, or the rugged trunk of a tree. In general, all climbing plants, when they are not furnished with the means of raising themselves up, extend their shoots along the surface of the ground, when they become what are called trailers, or they root into it like the ivy, and become what are called creepers. Climbing plants are of singular use in gardening for covering walls, ornamenting trellis-work, arcades, verandas, or ornamental props, in the form of cones, pyramids, parasols, &c.

Cli'vea.—*Amaryllidàceæ.*—An imperfect bulb, or leek-rooted plant, of easy culture in the greenhouse in loamy soil; it preserves its deep green foliage all the year, and sends up strong stems bearing red and yellow flowers from May to August.

Clinto'nia.—*Lobeliaceæ.*—Beautiful little annuals, flowering profusely the whole summer. They are natives of California, but will bear heat better than the generality of annuals from that country. They are generally raised on a hotbed (the seeds being sown in February), and planted out in May; but they may be sown in the open border in April. They require a very rich soil, consisting of one part of sandy loam, two of vegetable mould, and one of rotten manure; or, where vegetable mould cannot readily be procured, of equal parts of sandy loam and manure; and they should be constantly watered while they are growing. The seed pod is below the flower, and looks like its footstalk. If the seeds are sown in pots as soon as they are ripe, and kept in shelter all the winter, they will be ready for planting out into beds or boxes, for a veranda or balcony, in March or April, and they will be brilliantly in flower by May; and if constantly watered, they will continue to produce a succession of blossoms, till the plants are destroyed by frost.

Clipping or shearing plants was a very common practice in gardens with all shrubs, many trees, and even fruit-bearing bushes, such as the gooseberry and currant, from the earliest times up to the commencement of the last century; but it is now chiefly confined to hedges and edgings. Evergreen hedges, such as those of holly, yew, and box, are generally clipped about midsummer; and this is also the season for clipping box edgings. Deciduous hedges, such as those of the common thorn, may either be clipped immediately after midsummer, or during winter; as, during the latter season, the sap is in a great measure dormant, and the wounded points of the shoots are the less liable to be injured by frosts. In general, both evergreen and deciduous hedges and edgings may be clipped at any period after the growth for the season is completed; but if cut or clipped before that takes place, the amputated shoots are apt to make a second growth, which thickens too much the surface of the hedge, and by excluding the air, ends by causing the decay of the interior branches. Broad-leaved plants used as hedges, such as the common laurel, should be cut with the knife by hand; as when the large leaves are cut through, the appearance of the hedge afterwards is mutilated and unsightly. Holly hedges are also best cut by hand. Privet, yew, and box hedges may always be clipped. Thorn hedges, in the best agricultural districts, are generally cut with a hedgebill; and the stroke is always made upwards, in order not to fracture the shoots; as breaking them, by admitting moisture, causes them to decay at the points, and also stimulates them to produce small shoots, which thicken the hedge too much at the surface. There are two kinds of shears for cutting hedges; the common kind, in which the two blades work on a fixed pivot, and make a crushing cut which bruises the shoot; and the pruning-shears, in which the pivot is fixed into one blade, and the other moves over it in a groove, in consequence of which a draw-cut is produced in the same manner, as if the hedge had been cut by hand with a knife. All hedges, and especially all garden hedges, should be cut by this kind of shears.

Clothing the Stems of Trees is a practice resorted to with half-hardy species, such as some kinds of Magnolia, for the purpose of preserving vitality in the lower part of the stem, and the collar or neck of the tree, by excluding the cold, and throwing off the rain; because it is found that the seat of life in all plants is chiefly in the collar, and consequently, that a tree may have all its branches killed, and all its roots, excepting a part of the trunk next the collar, and a part of the main roots below it, and yet live. The best kind of clothing is wheat straw, or long slips of bark; and these ought to be spread out at the base of the trunk, so as to throw off the rain to a foot or two of distance from the collar.

Cobæa. — *Cobaceæ*, or ***Polemonaceæ***.—***C. scandens*** is a climbing plant of very rapid growth, and producing abundance of large bell-shaped flowers, which are first green, but afterwards become purple. The plant, if allowed plenty of room for its roots, and grown in a rich sandy loam, will extend along a wall or trellis, thirty or forty feet, in the course of a single summer. When it is wanted to cover any broad space, the points of the shoots should be repeatedly pinched off, to make it throw out lateral shoots; and these should be trained to cover the bare places. When the wall is rough, the plant will adhere to it by means of its own tendrils; but it is generally better either to nail it, or to tie it to any projecting parts with strands of bast-mat. The roots may be either in the open ground, in the free soil of the conservatory, or in a pot; but in the latter case they should be allowed abundance of room, and the pot should be well drained. The plant may also be treated either as an annual, a biennial, or a perennial, according to convenience. When treated as an annual, the seeds should be sown on a hotbed in February; and the plants should be transplanted into pots, and afterwards into the open ground, where they are to flower, in April or May. When the plant is grown as a biennial, the seeds should be sown as soon as they are ripe in pots, and the young plants should be kept under shelter in a room or greenhouse during winter, transplanting them two or three times, till spring, when they should be removed to the open ground, or to a larger pot, for flowering. It may also be treated as a perennial, when cuttings should be struck in autumn under a bell-glass, and the pots plunged into a hotbed or tan-pit; or, if the plants be growing in the open air, layers may be made by pegging down the lower shoots of the growing plants on the ground, and leaving them in the open garden; only taking care to protect them, after they are separated from the parent plant, by a hand-glass during winter. Till lately, *C. scandens* was the only species of the genus known; but in the autumn of 1839, and the spring of 1840, some other species have been raised from Mexican seeds sent home by Mr. Hartweg, one of the botanical collectors employed to collect new plants by the London Horticultural Society. The common Cobæa is also a native of Mexico, where it is called by a Spanish name, signifying the *violet-bearing Ivy*.

Coccinella.—Under this name naturalists distinguish the little beetles generally called lady-birds, or lady-cows. They creep slowly when in their perfect state, and they are generally found on the ground; and though they fly fast and well, they are rarely seen on the wing. They do no injury to plants, either in their larva or their perfect state; and when the perfect beetle is found on a plant, it is to find a place where it can lay its eggs. Instinct teaches it to visit those plants most infested with aphides, for it is on these noxious insects that the larva of the lady-bird feeds; and consequently, the eggs of that insect, which are of a bright yellow, are always found on the leaves of shoots the points of which are covered with the green fly. The larvæ are flattish, fleshy grubs, tapering to the tail; they have six legs, and are very active. Some years lady-birds are much more numerous than in others; but their numbers are always found to bear a proportion to those of the aphides on which they feed. In France and Germany, no peasant will kill them, because they are considered to be sacred to the Holy Virgin; whence, no doubt, they have received the name of lady-bird. When these insects are caught, they fold up their legs, and emit a yellow fluid from their joints, which has a very unpleasant smell; but which is so far from being injurious, that it is considered a remedy for the tooth-ache. Sometimes the country people even crush the poor beetle, and apply it to a hollow tooth, to prevent it from aching; and thus, as in many other cases, in the hope of an imaginary good, they do themselves a real evil; as of course, it is the interest of all amateurs of gardening, and particularly all lovers of roses, to protect the lady-birds.

Cocculus.—*Menispermaceæ*.—Climbing stove plants, with greenish white flowers and red berries. One or two species will grow in the open air. The soil should be loam and peat, and the roots should be allowed plenty of room.

Coccus.—The scale-insect. These insects are troublesome on many plants; but more so in the kitchen-garden, on the vine and pine-apple, than on flowering plants. One species of Coccus infests the Opuntia, and is what we call cochineal; and another on a kind of fig-tree in India, produces the substance we call shell lac, which is used in making sealing-wax. The only cure for these insects is brushing them off, and washing the branches affected with soft soap and water.

Cochineal Fig.—See **Opuntia.**

Cockscomb.—See **Celosia.**

Cockspur-thorn.—See **Cratægus.**

Coffea.—*Cinchonaceæ,* or *Rubiaceæ.*—The Coffee-tree, in England, becomes a stove-shrub, which should be grown in loam and peat, in pots well drained, and sufficiently large to allow of plenty of room for its roots. The flowers, which appear in August or September, are white and sweet-scented, and the fruit is round, and of a brilliant scarlet, inclosing two closely-packed seeds, which are the coffee. If the plant is kept well watered, it will flower every year, and the seeds will often ripen in England; but the coffee made from them is very inferior to even the worst of that ripened in the tropics. The coffee-tree, being a native of Arabia, requires a dry heat when it is in a growing state, and only a moderate degree of warmth in winter. When kept in a moist stove, without a free circulation of air, the leaves become mildewed and infected with insects.

Co'lchicum. — *Melanthaceæ.* — Meadow Saffron. A hardy bulbous-rooted plant, which will grow in any common soil. The flowers come up through the ground without the leaves in autumn, and closely resemble those of the crocus. The leaves do not appear till the following spring, and great care should be taken of them; as if they should be injured, so as to prevent them from exercising their proper functions in maturing the sap, the bulb will not flower the next autumn. An extract of Colchicum is given in medicine for the rheumatism and the gout; and it is said to form the basis of the celebrated eau médicinale. It is, however, poisonous, if taken in large quantities.

Cold Houses for Plants are not generally in use, though it is a common practice with gardeners to remove plants from hothouses into the back sheds, in order to retard their blossoming or the ripening of their fruit. It is also the practice in some countries to place pots of fruit-bearing or flowering shrubs, in ice-houses, so as to keep them dormant through the summer; and in autumn to remove them to forcing-houses, where, in consequence of having been so long in a state of rest, they grow with great rapidity, and come into flower much sooner than if they had not been so long retarded. Bulbs are also retarded in a similar manner; and even nosegays are placed in ice-houses in Italy and other warm countries, when it is wished to retard their decay for particular occasions.

Colic Root.—See **Alectris.**

Colli'nsia.—*Scrophularìneæ.*—Californian annuals, of great beauty, and well deserving cultivation. The handsomest species are *C. bìcolor,* and *C. heterophýlla,* which are very nearly allied; and which, if sown in autumn, and grown in rich loamy soil, will grow two feet high, and will produce splendid spikes of flowers. *C. grandiflòra* and *C. vérna* are also very nearly allied, if not the same, and they are smaller plants, with rather small, but bright-coloured flowers. They grow best in stiff clay. For the general culture of the genus, see Californian Annuals.

Collo'mia. — *Polemoniaceæ.* — Hardy annuals, natives of California, but scarcely worth growing, from their coarse and weedy appearance. *C. coccinea* is, perhaps, the best.

Coltsfoot.—See Tussila'go.

Columbine.—See Aquile'gia.

Colu'tea.—*Leguminoseæ.*— The Bladder Senna. Large deciduous hardy shrubs, growing and flowering freely in any common soil. *C. cruénta* is the smallest and the handsomest species. They are all propagated by layers or cuttings.

Combre'tum. — *Combretàceæ.* — Splendid climbing stove-shrubs, natives of Sierra Leone, where they support themselves by means of a very curious kind of hook, formed by the persistent footstalks of the withered leaves. The principal kinds are *C. purpùreum*, *C. comòsum*, and *C. grandiflòrum*. They are all very beautiful, and all require to be grown in a mixture of loam and peat. They are propagated by cuttings or layers. Though generally grown in a stove, they may be made to flower in a greenhouse, or in the open air. See Allamanda.

Commeli'na.—*Commelíneæ.*—Perennial and annual plants, hardy and tender, with beautiful bright blue flowers. *C. cœléstis*, L., has tuberous roots, but it may be raised from seed, by sowing it in a hotbed early in the season, and turning it out into the open border in common garden soil, tolerably rich, during the summer; and in autumn its tuberous roots may be taken up, and preserved during the winter, to be replanted in the open ground in spring; or they may be protected by covering the ground with ashes or sand.

Cona'nthera.—*Asphodelaceæ.*— Chilian bulbs, requiring the greenhouse; useful from their small stature, which seldom exceeds six inches, and from their producing their blue flowers in March.

Compositæ.—The composite flowers, such as the daisy, are in fact heads of flowers, composed of hundreds of little flowers or florets, as they are called by botanists, each of which has its corolla, stamens, pistil, and fruit. The central part, which in the daisy is yellow, is called the disk, and the florets composing it are nearly tubular; while the outer part, which in the daisy is white, is called the ray, and its florets are ligulate, or flat and open at the extremity, and tubular at the base. In many species, the seeds are crowned with a kind of feathery wing, like those of the Dandelion, which botanists call the pappus.

Compost-Ground. — A space in some secluded part of a garden, near the hothouses and pits, and near the tool-house and reserve ground, in which different kinds of soils, manures, and composts are prepared and kept. Though secluded, it should not be shaded altogether from the sun; and the ground should be drained, in order that the manure, &c., may not be soaked with moisture.

Compost.—This word is applied to any soil that is composed of several different ingredients; such as sand, loam, and peat, or vegetable mould, &c. These mixed soils are found to be much better for plants than any soil consisting of only one material; and thus, whenever choice plants are to be grown, directions are generally given for making a compost for them. In all large gardens, heaps of several different kinds of earths are kept in the reserve ground, ready for mixing as they may be required; but in small suburban gardens, peat, loam, and sand will suffice. These soils may be bought in small quantities from the London nurserymen, say sixpenny worth or a shilling's worth of each; and they may be kept in large pots in a back shed, for mixing as required.

Conservative Wall. — Many greenhouse and some hothouse plants, particularly such as are deciduous, and are naturally of rapid and vigorous growth, are found to succeed remarkably well when planted out during the summer season in the open garden, either as standards, or against a wall. Those which are planted as standards or bushes in the open beds or borders, grow vigorously during the months of June, July, and August, but require to be taken up in September, and preserved during the winter in pots or boxes, for planting out next season. This is practised with Fuchsias, Brugmansias, Pelargoniums, and similar plants. Other shrubs are planted against a wall with a southern exposure; and those not only grow and sometimes flower during the summer, but if protected during the winter with matting, or a projecting roof, or both, they will live for several years, growing vigorously, and flowering every season. The common myrtle, some of the Acacias, the Eucalypti, and a number of the rapid-growing New Holland shrubs, are so treated with great success; and the fine appearance which they make in the summer season, amply repays the expense and trouble which must be taken with them. There is scarcely any limit to the number and kinds of shrubs which may be treated in this way; for while the taller and more rapid-growing kinds are made to cover the upper part of the wall, the dwarfer species may be trained against the lower part, and herbaceous plants, including bulbs, may be planted all along the *base.* The border in which the plants are grown should be of light sandy soil, of no great depth; and it would be an advantage to thatch it during the winter season, to carry off the rain to a distance from the roots of the plants. The drier all half-hardy plants are kept in the open ground, the better, excepting during the growing and flowering season; in order that the plants may make no more wood than what they can thoroughly ripen. Walls used for purposes of this kind are called conservative walls; and next to conservatories, they form the most interesting scenes to the lovers of plants in an ornamental garden.

Conservatory.—This term originally implied a house in which orange-trees, and other large shrubs, or small trees, were preserved from frost during the winter; but at present it is applied to houses with glass roofs, in which the plants are grown in the free soil, and allowed to assume their natural shapes and habits of growth. A conservatory is generally situated so as to be entered from one of the rooms of the house to which it belongs; and from which it is often separated only by a glass door, or by a small lobby with glass doors. It should, if possible, have one side facing the south; but if it is glazed on every side, it may have any aspect, not even excepting the north; though in the latter case, it will only be suitable for very strong leathery-leaved evergreens, such as Camellias, Myrtles, &c. The bed for the plants should be of sandy loam (that being the soil that will suit most plants), two or three feet deep, and thoroughly drained. The plants should be of kinds that will grow in a few years nearly as high as the glass; and they should, as much as possible, be all of the same degree of vigour, otherwise the stronger kinds will fill the soil with their roots, and overpower the weaker. This, to a certain extent, takes place in all conservatories, and is unavoidable. The only remedy for the evil, is occasionally to cut in the large roots of the stronger plants, and prune in their tops, and every six or seven years to take up all the plants, excepting, perhaps, some of the climbers, and to renew the soil, and re-plant either with the same or with other plants, or with part of both. The pillars which support the roof, and, to a certain extent, the under side of the rafters, may be clothed with creepers; but great care must be taken that these do not exclude too much light from the plants beneath them, which may always be known by the etiolated sickly appearance of the latter. The most suitable plants for conservatories are those that flower in the winter season, or very early in spring; such as the Acacias, Camellias, Melaleucas, Metrosideroses, Banksias, Oleanders, &c.; and for climbers, the Kennedias, Zychyas, Hardenbergias, Bignonias, Tecomas, Ipomæas, Cobæa, Passifloras, Tacsonia, Clematises, &c.

Convalla'ria.—*Smilaceæ.*—The Lily of the Valley. A well-known and very fragrant little flower, requiring a shady situation, and rather a moist soil, which should be tolerably light. The plant will grow under the drip of trees, and it is increased by dividing the root.

Convolvulus. — *Convolvulaceæ.* —Well-known splendid climbing plants, hardy and half-hardy, annual and perennial. They all require a rich but light soil, and will grow well in a compost of equal parts of heath mould and loam, enriched with about the proportion of a fourth part to the whole, of decayed leaves, or thoroughly rotten manure; and they should be trained against stakes or trellis-work, as their stems are too feeble to support themselves. Most of the tender kinds of Convolvulus were separated from it by Linnæus, and formed into the genus *Ipomœ'a.* All the stove kinds may be made to flower in the open air, during summer, by contriving to keep the roots in heat (see Allamanda); and the hardy species only require sowing in the open ground.

Coral tree.—See Erythrina.

Corbularia. — Mr. Haworth's name for one of the new genera he formed out of Narcissus.

Co'rchorus. —*Til'aceæ.* — Hothouse plants, not sufficiently ornamental to be worthy of general cultivation. For the well-known Japan half-hardy shrub, generally called Corchorus, see Kerria.

Coreo'psis.—*Compósitæ.* — Most of the showy annuals formerly known by this name, are now called Calliopsis, while most of the perennial species are still left in the former genus. For the difference between the derivation of the two names, and the culture of the annual species, see Calliopsis. The perennial kinds are quite hardy; but as they are tall-growing spreading plants, they require a great deal of room, and should be planted at the back of the borders. They will grow in any common soil; and they are propagated by division of the roots.

Coria'ria —*Coriaceæ.*—The myrtle-leaved Sumach. A dwarf shrub, with handsome leaves, and but small flowers. It will grow in any common soil, and is increased by division of the roots.

Corms.—Solid bulbs, such as the Crocus, the different kinds of Moræas, Babianas, and most of the Iridaceæ. Bulbs are of three kinds: those which have a number of coats, or skins, one within the other, like the Hyacinth, which are called tunicated bulbs; those which consist of a number of scales, only attached at the base, like the Lily; and those which are only a solid mass of feculent matter, and which are called Corms, and which Dr. Lindley does not allow to be bulbs, but calls underground stems. Corms do not require taking up so often as bulbs; and when they are intended to remain for several years in the ground, they should be planted from four to six inches deep at first; as every year a new corm will form above the old one; and thus, if planted too near the surface, the corm, in a few years, will be pushed out of the ground.

Corn Cockle.—See Githago.

Cornelian Cherry.—See Cornus.

Corn Flag.—See Gladiolus.

Cornus.—*Cornàceæ.*—The Dogwood. Well-known shrubs, with whitish or yellowish flowers, and dark purple berries. The species are generally ornamental, from the shining red bark of their branches in winter, and the intensely dark purplish red of their leaves in autumn. One species, ***Córnus mas***, the Cornelian Cherry-tree, a native of Europe, is remarkable for the large size and brilliant colour of its fruit; and another, a native of North America, ***Córnus flórida***, for the large size of its flowers, or rather for that of the involucres, or floral leaves, which surround its flowers, and which are of a brilliant white inside, and tinged with violet on the outside. All the species are remarkable for the hardness of their wood, and for the great length of time which their seeds will remain in the ground before they come up. On this account, when any kind of Cornus is to be raised from seed, the seeds should be steeped in water before sowing; but, generally speaking, all the kinds are propagated by layers or cuttings of the old wood, both of which strike root freely. ***C. flórida*** is generally grown in peat, in a sheltered situation, and thrives best where its roots are kept in the shade; but unless its foliage is fully exposed to the influence of the sun, it will not flower. Travellers in North America describe what are called there the Dog-woods, as vast forests of this tree, about twelve feet high, with their branches so interlaced as to prevent a gleam of sunshine from reaching their roots.

Coroni'lla. — *Leguminosæ.* — Ornamental shrubs, hardy and half-hardy, with bright yellow flowers, and pinnate leaves. ***C. Emerus***, the Scorpion Senna, a native of the South of Europe, and the commonest and hardiest species, has the flower-buds red, and the expanded flowers of a bright yellow. It will grow in any soil or situation, and, as it will bear clipping without much injury, it may be grown as a hedge-plant. It will grow in any garden soil, and is propagated by cuttings of the ripe wood or layers. *C. glauca*, which is a native of France, has bluish-green leaves, and yellow flowers, which are fragrant during the day, but lose their scent at night. It flowers early and freely, and though generally kept in the greenhouse, it is very nearly hardy. The soil should be a sandy loam, mixed with a fourth part of vegetable mould, or rotten manure; and the pots should be well drained. It is propagated by seeds, which it ripens in abundance, or by cuttings in sand, under a bell-glass.

Corræ'a. — *Rutàcea.* — Dwarf greenhouse shrubs, with leathery-leaves, which are generally either brown or white on the under surface. The flowers are tubular; those of ***C. álba***, and ***C. rùfa***, which are white, being much less so than the others. Several new species, or hybrids, have been introduced since 1835; but they appear most nearly allied to ***C. speciòsa.*** All the species and varieties flower abundantly; producing in a greenhouse a constant succession of flowers from November to June. They require an airy, but a somewhat shaded, situation. The pots should be well drained, and the soil should be heath mould, mixed with a little loam.

CORYA'NTHES. — *Orchidaceæ.* — Helmet-flower. — *C. macrántha*, Lindl.—(*Gongòra macrántha*, H.) has a most singular red and yellow flower, part of which resembles a skeleton's head, with the vertebræ of the neck, and part two folded bats' wings. The plant is grown in a pot in sandy peat, mixed with lime rubbish; and the soil is raised above the level of the pot, as the flower-stalk hangs down from the root. It is a native of the West Indies; and, like most other of the tropical *Orchidaceæ*, it requires abundance of heat and moisture to throw it into flower.

CORYDA'LIS.—*Fumariàceæ.*—The plants composing this genus were formerly considered to belong to *Fumaria*, the Fumitory, but they have been separated on account of the different conformation of the capsule. *C. glaúca*, which is the most common species, is an annual from North America, which may be sown at almost any season, and in any soil and situation. *C. claviculàta*, is a British climber, also an annual, and pretty from the abundance of its small white flowers. It is of very rapid growth, and it is useful in covering a trellis, &c., from the number and dense habit of growth of its leaves. It grows best in a poor sandy or gravelly soil.

CORYLUS.—*Amentaceæ* or *Cupuliferæ.*—The botanic name of the Hazel, Filbert, &c. The species are generally shrubs; but *C. colúrna*, the Constantinople nut, is a large tree.—See HAZEL.

CORYSA'NTHUS.— *Orchidàceæ.* — Terrestrial orchidaceous plants, from New Holland, which will grow in the open air in England, if protected from frost during winter. They have dark brown flowers, and are so seldom cultivated, that they would not have been mentioned in the present work, had it not been to prevent them from being confounded with Coryanthes, a genus of Stove Orchidaceæ, from the West Indies.

CO'SMEA, or CO'SMOS.— *Compositæ.* —Mexican plants, generally grown as annuals, but which have tuberous roots like the Dahlia, and may be treated like that plant. The flowers are very showy, and of a reddish purple; and the seeds, when the plants are grown as annuals, should be sown in March or April, in the open ground; or in autumn, if the young plants can be protected during winter. The plants will grow four or five feet high in any common garden soil.

COTONEA'STER.—*Rosàceæ.*—Small trees and shrubs, natives of Europe and India, formerly considered to belong to the same genus as the Medlar. They are all well deserving of cultivation in shrubberies, for their bright scarlet or black fruit, and their pretty white or pink flowers. The Nepal species, *C. frigida*, *C. affìnis*, *C. acuminàta*, and *C. nummulària*, are the most ornamental. *C. rotundifòlia*, and *C. microphýlla*, also natives of Nepal, are remarkable for their thick leathery evergreen leaves, their snow-white flowers, and their profusion of bright scarlet fruit. Both the latter species form dwarf spreading shrubs, and are very ornamental for a lawn. All the species are hardy, and will grow in any common soil; and they may all be propagated by seeds, layers, cuttings, or grafting on the common quince or hawthorn.

COTTON-GRASS.—See ERIOPHORUM.

COTYLE'DON.—*Crassulàceæ.*— Navelwort. Succulent plants, with fleshy leaves, and yellow or red flowers, nearly allied to the House-leek. They should be grown in light earth, mixed with lime rubbish, or in a compost of peat and loam; and the pots should be well drained. The ornamental species are all natives of the Cape of Good Hope; and they are propagated by cuttings, which should be laid on a shelf for a few days to dry before they are planted. The European species are scarcely worth cultivating. The plant called Venus's Navelwort does not belong to this genus, but to Omphalodes. *C. sempervivum*, Bieb., (*Umbilicus sempervivum*, Dec.,) is one of the commonest species.

Co'tula. — *Compositæ.* — Hardy and tender annuals, of which, *C. aúrea*, L., the flowers of which are like little golden balls, is the only one worth cultivating. It will grow in any common garden soil, and requires to be sown in March, with the usual treatment of hardy annuals.

Cow-itch.—See **Mucu'na.**

Cowslip. — *Primulàceæ.*— *Prímula vèris*, the common Cowslip, is a well-known British plant, which, when cultivated in gardens, should be grown in a loamy soil and sheltered situation.

Cranesbill.—See **Geranium.**

Cra'ssula.— *Crassulàceæ.*—Succulent greenhouse plants, natives of the Cape of Good Hope, with heads of red or white flowers. They should be grown in sandy loam, and lime or brick rubbish, and the pots should be well drained. Like all the Cape plants, all the kinds of Crassula should have alternate seasons of stimulus and repose. When they are growing, and about to flower, they should be well watered, at least once every day, though the water should never be suffered to stand in the saucer; and when the flowers begin to fade, the supply of water should be gradually lessened, till, at last, very little is given, and that not oftener than once a week. The plants are propagated by cuttings, which should be laid on a shelf two or three days to dry before planting, or they will rot. When plants of Crassula are not well drained, or if stagnant water is retained round the roots, by letting water stand in the saucer, the stems are very apt to damp off. *C. coccínea* and some other species were separated from the others by Mr. Haworth, and formed into the genus Kalosanthes; but this name does not appear to have been adopted by many persons, and the plants are still generally called *Crássula*, both in nurseries and private collections.

Cratæ'gus. — *Rosàceæ.* — The common Hawthorn, *C. Oxyacántha*, is so well known for its fragrant and beautiful flowers, that most persons will be anxious to know the other species of the same genus; and, in fact, several of the North American thorns are the most ornamental low trees we have in our gardens and shrubberies. The species are all hardy, and they all flower and fruit freely, and are equally ornamental in both states. Almost all the flowers are white; but the fruit varies in colour, some being scarlet, some yellow, some purple, and some green. The fruit varies also in size from that of *C. spathulàta*, which is not larger than a grain of mustard-seed, to that of *C. Mexicàna*, which is nearly as large as a golden pippin. The fruit of *C. Azaròlus*, *C. Arònia*, and *C. tanacetifòlia*, all large and yellow, and that of *C. odoratíssima*, of a bright coral colour, are all very good to eat; and many persons do not dislike the haws of the common hawthorn. There are nearly a hundred different kinds of Cratæ'gus, including the hybrids and varieties; and of these, thirty-one are varieties of the common hawthorn. The handsomest species for their flowers, are the red-blossomed and double-flowered hawthorns; the handsomest for their leaves, are the different kinds of cock-spur thorn (*C. crus-galli*), *C. punctàta*, *C. pyrifòlia*, *C. prunifòlia* (the leaves of which die off of a deep red), and *C. Leeàna:* and the most curious for their fruit are *C. Douglassii*, *C. Mexicàna* and *C. orientàlis*. The earliest-flowering in spring are *C. purpùrea*, and *C. nìgra*, the latter of which is said to attract nightingales; and the Glastonbury thorn, a variety of the common Hawthorn, often flowers at Christmas. *C. Oxyacántha péndula*, and *C. O. regìnæ*, Queen Mary's thorn, have both pendulous branches; and *C. O. strìcta* and *C. tanacetifòlia* grow stiff and upright, like a Lombardy poplar. *C. tanacetifòlia* and *C. odoratìssima* have bluish-green leaves, which look as though they had been slightly powdered; and *C. crus-galli splendens*, and several other kinds, have their leaves of a shining dark blackish green. *C. pyracantha* is an evergreen, and has a very good effect when trained against a wall, from its shining leaves, its bunches of pure white flowers, and its brilliant scarlet fruit, which are so abundant in winter as to induce the French to call the plant *Buisson ardent*, or the Burning Bush.

All the species of Cratægus will grow well in any soil that is naturally dry; but if planted in marshy ground, they will be stunted in their growth, and their leaves and fruit will become spotted and unhealthy. The common Hawthorn is propagated by seeds, which often lie two years in the ground before they germinate, if not prepared before sowing, by being suffered to lie for several months in what is called a rot heap; and which is often turned over during that time, to prevent the seeds from having their vital powers destroyed by the heat generated by fermentation. The finer kinds of thorns are generally grafted or budded on seedlings of the common Hawthorn.

Creeping Cereus.—*Cèreus flagellifórmis.* A succulent plant with long round pendant stems, beautiful pink flowers, and dark purple eatable fruit. For the culture, &c., see **Cereus.**

Crepis. — *Compósitæ.* — Annual, biennial, and perennial plants, natives of Europe, of easy culture in any common soil. The two kinds most common in gardens are, however, now removed to other genera; *C. barbata*, the yellow hawkweed, being now made *Tolpis barbata*, and *Crepis rubra*, the red hawkweed, being now called *Borkhausia rubra.* The first kind only requires sowing in the open ground with the other annuals in March or April, and may be transplanted if necessary; the second is also quite hardy, but it should be sown where it is to remain, as it does not well bear transplanting.

Cress Rocket.—See **Vella.**

Cri'num. — *Amaryllidaceæ.* — Stove bulbous-rooted, lily-like plants, with very long leaves and large white flowers, which in some species are fragrant. The plants should be grown in rich loam mixed with a little peat and sand, and allowed plenty of pot-room. They are increased by suckers, which are produced very sparingly. Several of the plants which are called by some botanists Crinum, are called by others Pancratium, or Amaryllis.

Cro'cus.— *Iridaceæ.*— There are nearly a hundred named kinds of Crocus, including hybrids and varieties; but there are only about thirty distinct species. All the kinds have solid bulbs or corms, and they should not be taken out of the ground oftener than once in three years, being replanted as soon as possible. The commonest kinds are *C. vernus,* of which there are many varieties, all, however, having in them some shade of lilac mixed with white; *C. versícolor*, to which division belong the beautifully-feathered kinds of purple; *C. biflorus*, the Scotch crocus, striped white and purple, and generally the first to flower in spring; *C. susiànus*, the cloth of gold, striped orange and very dark purple; *C. sulphùreus*, very pale yellow, or cream-coloured; and *C. lùteus*, the common yellow. Besides these, there is *C. satìvus*, the autumn-flowering crocus, or saffron, which is cultivated, on a large scale, in some parts of England, particularly near Saffron Walden in Essex, for its flowers, which, when dried, become saffron, and are used in dyeing. There are also large plantations of saffron in France; but in that country the bulb is frequently attacked by a fungus, which the French call *mort de safran*, which makes it wither up, and perish. All the kinds of spring crocuses should be grown in light sandy loam well drained, and they may be planted either in rows, or beds; or they may be made to form a kind of Arabesque pattern in the borders.

In whatever way the crocus may be planted, the leaves should never be cut off till they begin to wither, as without their assistance the plant cannot accumulate matter to form its new bulb for the ensuing season. The new bulb always forms above the old one; so that in four or five years, they will have almost pushed themselves out of the ground; and from this habit of growth, crocuses are generally planted three or four inches deep. Crocuses, when in flower, are frequently destroyed by sparrows, which peck at them, and the bulbs are often eaten by mice. They ripen abundance of seed, but the seedlings do *not flower* till the third or fourth year.

Crocks, or Potsherds.— Broken pieces of flower-pots, bricks, or tiles, used for draining plants.

Crossbreds differ from hybrids in being produced by plants more nearly allied to each other; as two varieties of one species, two nearly allied species, &c. For the mode of making these crosses, see Geranium and Hybrid.

Crosswort.—See Crucianella.

Crotala'ria. — *Leguminosæ.* — Herbaceous plants, natives of the East and West Indies, and a few shrubs, natives of the Cape, with showy pea-flowers, generally either purple or yellow. There are a few annual species, the hardy ones of which are natives of North America, but the species most commonly cultivated are greenhouse shrubs. They should be grown in sandy loam and peat, well drained; and they are propagated by cuttings of the young wood and seeds.

Cro'ton. — *Euphorbiaceæ.* — Mostly stove-shrubs, natives of the East Indies and South America. *C. picta* (*Codiæum pictum*, Juss.) is a very remarkable and ornamental plant, from the brilliant colour of its leaves, which are variegated with blotches of scarlet, yellow, and dark purple. This species should be grown in lime-rubbish and peat, or in sand only, and the pots must be well drained, or the leaves will soon become green, and lose their beauty. The Croton oil is made from an annual species, *C. Tiglium*, a native of the East Indies. The shrubby kinds are propagated by cuttings, which should not have their leaves shortened, and which must be struck in moist heat.

Crowfoot.—See Ranunculus.

Cro'wea. —*Rutaceæ.* — A very pretty New Holland shrub, which will flower nearly all the year. It should be grown in a compost of vegetable mould, sand, and peat, and the pots must be well drained; as, though it requires frequent watering, no plant suffers more from the effects of water being allowed to remain in a stagnant state about its roots. Whenever the leaves turn yellow, and the flowers drop off without expanding, the cultivator may feel assured that there is some fault in the drainage, and the plant should be repotted. It is increased by cuttings.

Crown Imperial. — See Fritillaria.

Crucianella.—*Rubiàceæ*, or *Galiàceæ*. — The very beautiful little plant called *C. stylosa*, has brought this somewhat neglected genus again into notice; though Dr. Lindley doubts its belonging to the genus at all. As, however, it is generally so called in gardens and nurseries, nothing further will be said here on the subject. It is a hardy perennial, a native of mountains in Persia, growing about a foot high in any good garden soil, and well adapted for beds in a geometric flower-garden, from its profusion of bright pink flowers which it continues producing from June to September. It is well adapted for rock-work, and it is increased by dividing the roots.

Cryptogamous Plants.— Mosses, ferns, lichens, and other plants, which do not produce any visible flowers.

Cuckoo-flower.—Several spring-flowering British plants are known by this name, but that most commonly so designated is *Cardàmine pratensis*.

Cucu'balus.—*Caryophyllaceæ.*— Wild British flowers, resembling the *Silenè*, or Catchfly.

Cu'phea. — *Lythraceæ.* — South American plants, with very curious flowers, some of which are half-hardy annuals, and some stove-shrubs. They require a moist rich soil, and a shaded situation.

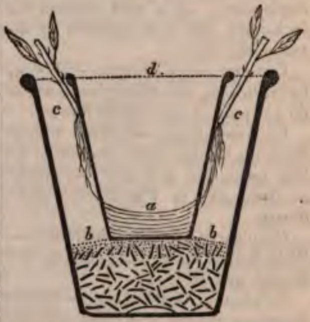
Cuscu'ta.—*Convolvulaceæ.*--The Dodder. Parasitical plants, which are sometimes grown in greenhouses; are objects of curiosity. When this is the case, the seeds should be sown in a pot, in which is growing a common horse-shoe geranium (*Pelargònium zonale*). As soon as the seed of the Cuscuta begins to germinate, it sends out a delicate thread-like stem, which is leafless, and which soon coils itself round the stem and branches of the poor geranium, adhering to them by a number of wart-like protuberances, or suckers, which appear at intervals along its stem. The root of the parasite now withers, but the plant itself continues to thrive, as it feeds, vampire-like, on the sap of the poor geranium; and it grows vigorously, producing abundance of leaves and flowers, while the geranium appears to sicken, its leaves turn yellow and drop off, and it finally wastes away. The geranium should be tall and much branched; and when this is the case, the Cuscuta forms avery ornamental object, hanging down in graceful festoons, and producing abundance of its glossy pale blush-coloured flowers, which are very fragrant. Sometimes this parasite is propagated by shoots, which should be wrapped in wet moss, and tied on the plant to which they are to adhere. Two species of Cuscuta are natives of Britain, and are very troublesome in oat-fields; but the other kinds are natives of the South of Europe and the tropics. The handsomest species, *C. verrucòsa*, is from Nepal.

Custard Apple.—See Anona.

Cuttings.—It may be received as a general principle, that all plants which produce shoots may be propagated by cuttings; though some plants are much more difficult to propagate in this manner than others. Generally speaking, all the soft-wooded succulent plants, which have abundance of sap, such as Pelargoniums, (Geraniums,) Fuchsias, Petunias, and Verbenas, strike root readily; while dry, hard-wooded plants, such as Heaths, and the different kinds of Epacris, are very difficult to strike. The usual directions for striking cuttings are, to put them in pure sand, and to cover them with a bell-glass; and this may be done as a precautionary method with all cuttings, though it is only essential with those that are difficult to strike. Some cuttings are directed to be made of the old wood, and some of the young tender shoots of the current year; in general, however, the safest plan is, to take off the shoot just below where the young wood is united to that of the previous season, so that a small portion of the old wood may remain attached to the cutting. The shoot should be cut off with what gardeners call a clean cut (as, if it be bruised, or left jagged, or uneven, it most probably will not grow); and it should be planted in sandy soil, to ensure drainage, as the cutting will rot, or, as gardeners term it, damp off, if water in a stagnant state be suffered to remain round it. When the cutting is put into the ground, the earth should be made quite firm to its lower end; as, if any space be left below it, the roots will wither as soon as they shoot forth. Cuttings are considered most likely to succeed when taken from the horizontal branches of the plant, nearest the ground; and as least likely to strike root, when taken from the upright shoots at the summit of the plant; though this rule has many exceptions. A shoot of the soft-wooded kinds, which strike easily, may be divided into several cuttings, all of which will grow; but with all the hard-wooded kinds, only one cutting must be taken from the tip of each shoot. Shoots which are of the average strength, are preferable to those that are either very strong or very weak; and those are best that have only leaf-buds, and no flower-buds on them.

Some cuttings which are difficult to strike, are directed to have bottom heat. This means, that the pots in which they are planted are to be plunged into a hotbed, that the stimulus afforded by the heat may induce the cuttings to throw out roots. Care must, however, be taken that the hotbed is not too hot, as in that case it sometimes burns the tender roots of the cuttings. Mr. Alexander Forsyth, a very intelligent young gardener, recommends the following plan:—Take a wide-mouthed forty-eight sized pot, and put some potsherds at the bottom, in the usual manner. Then take a wide-mouthed small sixty, and put a piece of clay in the bottom, to stop the hole, and then place it inside the other, so that the tops of both pots may be on a level. The space between the pots must then be filled in with sand or other soil, and the cuttings inserted as shown in *fig.* 10. The inner pot should be filled with water, and the outer pot may then be plunged in the

FIG. 10.

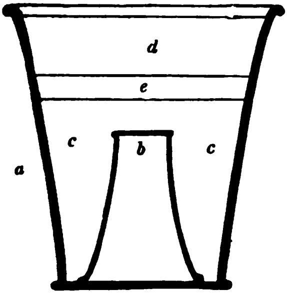


FORSYTH'S MODE OF STRIKING CUTTINGS.

ground, or into a hotbed, and covered with a glass, or not, according to the nature of the cutting. In *fig.* 10, *a* shows the clay stopping of the inner pot; *b*, the drainage of the potsherds; *c*, the sand, or other soil, in which the cuttings are inserted; and *d*, the water in the inner pot.

Another method, which is shown in *fig.* 11, is to have a small pot (a sixty), *b*, turned upside down in a larger pot (a thirty-two), *a*, and to have the space *c* filled with small pebbles; *e* is a layer of peat earth or moss, and *d* a covering of sand. This kind of pot is very useful for all cuttings that are liable to damp off, as the water trickles down through the pebbles; and if the pot be placed in bottom heat, the hot vapour rises through the pebbles in the same way, without burning the roots.

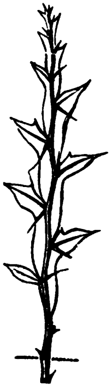
FIG. 11.



FYFFE'S MODE OF STRIKING CUTTINGS.

The following are the principal kinds of plants propagated by cuttings, divided into classes, each of which requires a different treatment:—Soft wooded greenhouse plants, such as Geraniums, Fuchsias, Brugmansias, Petunias, Verbenas, Tropæolums, Maurandyas, &c. These may have cuttings taken off in spring, or at almost any period during summer, and planted in sandy soil, with or without a glass over them, and with or without bottom heat. They may be considered as the easiest of all cuttings to strike, the principal art consisting in cutting the shoot across, through, or immediately under the joint, with a clean cut, preserving a few of the leaves on, and making the lower end of the cutting quite firm in the sandy soil in which it is planted. In the summer time, such cuttings may be planted in the free soil; and at other seasons, in order to admit of protection, in pots. In whichever mode they are planted, they must be kept in the shade, and in a uniform state in regard to moisture, till they have begun to grow. Their growing is an indication of their having taken root, when they should be taken up, and each planted in a separate pot.

Hard-wooded greenhouse plants, such as Camellias, Myrtles, evergreen Acacias, and most Cape and Australian shrubs, with comparatively broad leaves, are a degree or two more difficult to strike than Geraniums and



CUTTING OF ACACIA ALATA.

Fuchsias. The points of the shoots, after the spring growth has been completed, and before the young wood is thoroughly ripened, should be used; and the soil should contain a large proportion of sand, and be thoroughly drained. If cuttings of this kind are put in during autumn, they require to be kept through the winter under glass, and they will not produce roots till spring; but if the plants have made their growth, as most Australian shrubs do, in February or March, and the cuttings are taken off and planted in these months, they will root that same season, and be fit to transplant into small pots in the course of the summer. To accomplish this object, it is common with cultivators to force forward the plants from which cuttings are to be taken, by removing them from the greenhouse to the hothouse in January; and after they have made their shoots, to harden these before making the cuttings, by removing the plants back again to the greenhouse. Most cuttings of this kind require to be covered with a hand-glass, and some with a bell-glass.

CUTTING OF A CAMELLIA.

Heath-like plants, such as Erica, Epacris, Diosma, are among the most difficult to propagate by cuttings. The points of the shoots only are to be taken; and these, in some cases, should be not more than one inch in length. These should be taken off early in spring, when the plants have nearly ceased growing; and they should be cut clean across at a joint, and the leaves clipt, or cut off, for about half-an-inch of their length. The cuttings, thus prepared, are planted in pure white sand, well drained, with a little peat soil as a substratum; and they are covered with a bell-glass, and placed in a frame near the glass, and shaded. The best time for putting in Heath cuttings is in December; when plants, that have about half finished their growth, should be selected. The cuttings ought not to be more than one inch long; and even shorter cuttings sometimes strike better. The leaves must then be clipped off with a small and very sharp-pointed pair of scissors, to about half the length of the cutting, or less; as the shorter the shank of the cutting, the quicker it strikes, and there is less chance of its rotting. Great care is necessary in clipping off these leaves, and cutting the cutting across, so as not in the slightest degree to lacerate the bark, for the smallest wound or laceration will prove fatal to the cutting, by allowing the moisture to enter it, and thus damp it off. This, after all, is perhaps one of the principal reasons why so few, even of gardeners, strike Heath cuttings well; for the cuttings being very small and succulent, the operators are seldom sufficiently careful in clipping off the leaves with

CUTTING OF A HEATH.

scissors, but cut them off with a knife, resting the cutting on the thumb-nail; though it is evident, that by this process they cannot make a very clean cut; and, moreover, that they must bruise the bark, or tear down the petiole of every leaf they cut off. Having prepared the cutting properly, it must be gently taken in the left hand, with a pricker (a knitting needle answers exceedingly well) in the right, with which a hole is made in the sand to about the depth of the shank of the cutting; the cutting is then placed in the hole, and the pricker is again put into the sand, to close the sand round it; as great care must be taken that no vacuity is left between the sand and the cutting anywhere. As soon as the pots are filled with cuttings, a bell-glass should be put over them, and the pots should be placed on a greenhouse shelf, where the temperature is not lower than sixty degrees. They will require little attention afterwards; excepting now and then when the sun is out, or when snow has fallen, to shade them from excessive light, and to remove such cuttings as begin to rot; for one rotten cutting, if not taken away immediately, will infect the whole pot, and they will all damp off in a very little time. If a potful of each sort should be more than is required, care must be taken to sort the cuttings out in such a way that the smooth kinds may be placed together, and the hairy ones, the viscid ones, &c., by themselves. This separation is the more necessary, as the hairy kinds generally collect more moisture than the smooth sorts; besides the great difference of time required to strike them, some of the smooth or glabrous sorts striking in a month, while some of the viscid ones require three or four months. When the cuttings are put in December, the greater part of them will be struck by February or March, when they should be carefully potted into thumb-pots, about half full of very fine potsherds, and the other half filled up with soil composed of equal parts of finely-sifted peat and silver sand. The plants will now only require to be kept under the hand-glass for a few days, to let them root again; and then they must remain for about a fortnight or three weeks on the greenhouse shelf, after which they may be with safety removed to the cold frame.

CUTTING OF EPACRIS.

Cuttings of stove-plants generally require to be planted in the same kind of soil as the parent plant, and plunged in a gentle bottom heat, from a hotbed of tan or stable manure, under a bell-glass; though some of the more slender-growing kinds require silver sand, without bottom heat. As cuttings of many stove-plants are very large, care must be taken never to allow them to flag or droop, and also to preserve as many of their leaves as possible; indeed, this rule may be applied to almost all cuttings.

Succulent plants, such as Cactuses, Euphorbias, Mesembryanthemums, Crassulas, and the like, require to be kept out of the ground for a few days to dry, after they have been cut off; and then to be planted in a mixture of peat, sand, and brick rubbish, well drained. The pots may afterwards be set on the dry shelf of a warm greenhouse, and only occasionally and slightly watered; many of them, indeed, will require no water till they have struck.

Many plants, the shoots of which will not root readily, are easily increased by cuttings of the roots; such as some of the Acacias, Roses, &c. Roots not less than a quarter of an inch in diameter should be chosen, and planted in the same kind of soil in which they have previously been growing, with their tops just above the surface of the soil, and plunged in a gentle bottom heat, when they will, in a few weeks, form a bud, and send up a shoot, and thus become well-established plants in a shorter time than by almost any other method. Many hardy plants are raised from cuttings of the roots, and these only require to be put into light rich soil near a wall, or in any other sheltered situation, and to be kept rather moist, and shaded occasionally.

Cya'nus.—The Corn Blue-bottle. See Centaure'a.

Cy'cas.—*Cycadeæ.*—A kind of herbaceous Palm, requiring the heat of a stove, and remarkable for its curious root-like stem, and enormous fern-like leaves. It very rarely fruits in England, and the leaves of some of the species are said to wither if touched by the hand. It should be grown in a strong rich loam.

Cy'clamen.—*Primula'ceæ.*—Handsome and curious tuberous rooted herbaceous plants. *C. europæ'um* is a native of Switzerland, and is very fragrant; *C. còum,* and *C. vérnum* are natives of the South of Europe; and all these kinds are hardy in British gardens, and require no other care than to be grown in light rich soil. *C. pérsicum* is a greenhouse species, the roots of which should be planted in well-drained pots, early in September, and kept in the open air till they have thrown out leaves, when they should be removed to the *greenhouse.* They require plenty of air, and but very little heat; and during the months of November and December, they should have very little water; though, when the flowers begin to form, they should be abundantly supplied. When they have ceased flowering, the supply of water should be diminished; and about June, the roots should be taken out of the ground, and kept dry till the season for planting the following autumn. The best soil for them is equal parts of loam and rotten manure, or leaf mould, with a little peat and sand, or heath mould. All the kinds are propagated by seed, which they ripen in abundance; and they all require an open airy situation.

Cyclobo'thra.—*Liliàceæ.*—Bulbous-rooted plants, natives of California, with nodding flowers, like those of the Fritillarias. They are nearly hardy, and only require to be kept dry during winter, or to be taken up in autumn and replanted in spring. They flower at midsummer.

Cycno'ches.—*Orchidàceæ.*—An Orchideous plant, commonly called Swan-wort, from the graceful curve of the column of the flower, which resembles the neck of a swan. It requires a very damp atmosphere, and the greatest heat ever applied to a damp stove. For the culture see Orchideous Epiphytes.

Cydo'nia.—*Rosàceæ.*—The botanic name of the Quince tree; but now applied also to that beautiful and well-known shrub, with bright scarlet flowers, formerly called *Pŷrus japónica. Cydònia japónica,* though a native of Japan, is quite hardy, and will grow in any soil and situation if not too much exposed. It bears pruning without injury, and makes a good hedge. It retains its leaves nearly all the winter; and in mild seasons, and sheltered situations, it is almost always in flower. There are three or four varieties; some with half double flowers, and some the flowers of which are of a pale blush colour.

Cymbi'dium — *Orchidàceæ.* — Stove Epiphytes, with boat-shaped flowers. See Orchideous Epiphytes.

Cy`nips, the Gall fly. A kind of gnat, which occasions the galls on oaks, &c. The Bedeguar, a disease which affects rose-trees, is occasioned by *Cynips ròsæ,* a little insect, not more than the twelfth of an inch long, having the legs and body red, tipped with black. This little creature wounds the twig of the rose-tree and deposits its eggs under the bark. The wound swells, and forms an excrescence, often two inches in diameter, and covered with green or pink hairs, which are curiously branched at their extremities like little masses of coral. The excrescence is so ornamental that it seems almost a pity to destroy it, and yet, when opened, it will be found to contain a great number of the grubs or pupæ of the fly.

Cynoglo'ssum. — *Boragíneæ.* — Hound's tongue. Pretty little biennial and annual plants; natives of Europe, and requiring only the common culture of plants of a similar nature. Venus's Navelwort was formerly considered to belong to this genus, but it is now removed to Omphalodes.

Cype'lla.—*Iridàceæ.*—A beautiful bulbous-rooted plant, from Buenos Ayres. It requires the usual culture of the Iridaceæ. (See Cape Bulbs.)

Cypress.—See Cupressus.

Cypripe`dium. — *Orchidàceæ.*— The Ladies' Slipper. Terrestrial orchideous plants, mostly natives of North America. They should be grown in peat soil in a shady border, and covered with a hand-glass, or in some other manner so as to keep them dry during winter. They are very difficult to propagate in this country, and the plants bought in the seed-shops and nurseries have generally been imported from America.

Cyri'lla. — *Ericaceæ.* —Greenhouse shrubs with very small white flowers. For an account of the beautiful plant sometimes called *Cyrilla pulchella,* see Trevirana.

Cyrta'nthus. — *Amaryllidaceæ.* —Cape bulbs, with heads of showy tube-shaped flowers. For culture see Amaryllis.

Cyrtochi`lum. — *Orchidàceæ.* — Splendid Mexican epiphytes; which are generally grown on part of the branch of a tree, or in the husk of a cocoa-nut, hung up from the rafters of a hothouse, or damp stove. When planted, the roots should be wrapped up in wet moss, and tied on the branch, or placed in the husk; and the plants should be kept in a damp atmosphere, and frequently watered. Sometimes these epiphytes are grown in pots, in which case the soil should be peat, mixed with lime rubbish.

Cy'tisus.—*Leguminòsæ.*— There are above fifty kinds of Cytisus; but the kinds best known are the Laburnums, the common Broom, (*C. scopàrius,*) and the Portugal Broom, (*C. álbus.*) The common Laburnum, *C. Laburnum,* is a well-known tree, which if it were less common, would be thought extremely beautiful. There are only three or four distinct varieties, but the plant varies very much in the size of its flowers, in their colour, and the length of the racemes in which they are disposed, and in their fragrance. The Scotch Laburnum, *C. alpìnus,* is much more beautiful than the common kind; both the flowers and leaves are larger, and the flowers are more frequently fragrant. They are also produced much later in the season, not coming into flower till the others are quite over. This is the plant which the Italians call May, as we do the Hawthorn. The French call both species False Ebony, from the blackness of the wood; which, however, is much darker in *C. Laburnum* than in *C. alpìnus*. Both kinds will grow in any soil and situation, but they do best in a deep sandy loam, and a sheltered situation.

D.

Dabœ'cia.—*Ericàceæ.*—Professor Don's name for *Andromèda Dabœ'cia*, L., the Irish, or St. Dabœc's heath. It is quite hardy, but requires a moist peaty soil. The species has purple flowers; but there is a beautiful variety, the flowers of which are white.

Daffodil.—See Narcissus.

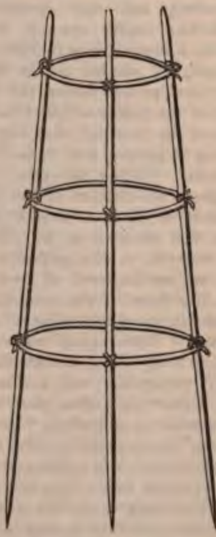
Da'hlia.—*Compósitæ.*—The importance that has within the last few years attached to this genus would render it easy to fill a volume with descriptions of its various species and varieties, and the details of their culture. Its history is also somewhat curious, as, strange to say, though it has become so great a favourite, and is so universally cultivated, the history of its introduction is very obscure. It is generally said to have been introduced by Lady Holland in 1804; but the fact is, it had been introduced many years before that period, and was only brought from Madrid in 1804, by Lady Holland, who apparently did not know that it was already in the country. The first kind of Dahlia known to Europeans, *D. superflùa*, Cav., (*D. variábilis*, Dec., *Georgìna pinnàta*, W.,) was discovered in Mexico by Baron Humboldt in 1789, and sent by him to Professor Cavanilles, of the Botanic Garden, Madrid, who gave the genus the name of Dahlia, in honour of the Swedish professor Dahl. Cavanilles sent a plant of it, the same year, to the Marchioness of Bute, who was very fond of flowers, and who kept it in the greenhouse. From this species nearly all the varieties known in the gardens have been raised; as it seeds freely,and varies very much when raised from seed. In 1802, *D. frustrànea*, Ait., (*D. coccínea*, Cav.,) was introduced from France, in which country it had been raised from Mexican seeds. A few varieties have been raised from this kind, but they are much smaller than the others. It is rather remarkable, that the two species do not hybridize together; and that *D. superflùa* or *variábilis* should produce flowers of colours so different as crimson, purple, white, yellow, orange, and scarlet, without hybridization. Among all the colours, however, displayed by these varieties, no flowers have yet appeared of blue, and comparatively few of a pure white. These two species, and their varieties, were the only Dahlias known in English gardens for many years; as, though a few kinds were introduced from time to time from France and Spain, yet as they did not hybridize with the others, and were rather more tender, they were not generally cultivated, and appear to have been soon lost. Most of these have, however, been reintroduced from Mexico, with several new species, within the last few years; and there are now ten or twelve distinct species, besides innumerable varieties of *D. variábilis*, to be procured in England. The most remarkable of the new species is the tree Dahlia, *D. excélsa*, which is said to grow in Mexico thirty feet high, with a trunk thick in proportion. The name of Georgina was applied to the Dahlia by Willdenow; because the word Dahlia was thought to bear too close a resemblance to the word Dàlea, which had been previously given by Thunberg to a small leguminous genus. As, however, the words are both spelled and pronounced differently, Professor De Candolle has recommended that the name Dahlia shall be retained, and most botanists of the present day have followed his recommendation. The name Georgina was given in honour of Georgi, a German botanist who resided for several years at St. Petersburgh.

The Dahlia is a tuberous-rooted plant, which is propagated either by seeds, or division of the root. The seeds are chiefly used for raising new sorts; and they should be treated like tender annuals, being sown on a slight hotbed in February or March, and planted out in May. The plants rarely flower the first year, but the tubers will form in the course of the summer, and may be taken up in autumn with those of the old plants. When the plants are propagated by division of the root, care must be taken that each piece has a bud attached to it. These buds, or eyes, as the gardeners call them, are not scattered all over the tuber, like those of the potatoe, but collected in a ring round the collar of the root. These eyes, when the root is in a dry state, are sometimes scarcely perceptible; and to discover them, nurserymen often plant their Dahlia-roots in a hotbed, "to start the eyes," as they call it; that is, to force the latent buds sufficiently forward to show where they are situated, before they divide the roots for the purpose of forming new plants. Sometimes the eyes do not form a ring round the collar or crown of the root, but a considerable portion of it is without any buds. These parts, when divided from the rest, are called blind tubers; and though, if put into the ground, they will live for several years, sending out abundance of fibrous roots every year, no gardener has yet been able to induce a blind tuber to form an eye, or to send up a shoot. This peculiarity should be kept in mind by all novices in floriculture; as dishonest persons frequently sell large and healthy-looking tubers, which are, however, worthless, from their being without eyes. To remedy this evil, an expedient has been devised of grafting the tubers of Dahlias in the same manner as is practised with the tubers of the Peony in France (see GRAFTING); but it requires great skill in the gardener to do this successfully, as the tuber is very apt to rot at the point of junction between it and the graft.

Dahlias are also propagated by cuttings of the stem, taken from the lower part of the plant; or young shoots slipt off the tuber with part of the woody fibre attached. The cuttings should be struck in sand, or very sandy loam, under a bell-glass, and with bottom heat. Great care should be taken to shade them from the direct rays of the sun, till they have thrown out roots; as the leaves are easily withered, and when this is the case, they cannot be recovered, and the cutting will perish, for want of a due circulation of the sap. The roots will generally form in a fortnight, or at most three weeks.

The best soil for Dahlias is a compost of equal parts of sand and loam, with a little peat; which may be enriched with part of an old hotbed, or decayed leaves. Manure of any kind should, however, be used very sparingly; as too much will cause the plant to produce strong, coarse-growing leaves and stems, instead of fine flowers. Striped flowers are always clearest and most distinct in their colours in poor soil. Dahlias will not grow well in the richest clayey soil without sand; and though they will grow freely in sand without loam, the flowers will be poor, and only semi-double. Though they flower so late in the year, Dahlias are killed by the slightest frost; and thus their beauty, great as it is, is generally rather short-lived. As soon as the leaves turn brown from frost, which is generally in October, the stems should be cut down; and in November, the tubers should be taken up. A dry day should be chosen, if possible; and the tubers should be carefully taken up, and laid on boards in an open shed, or some similar place, to dry. While drying, they should be turned every day, and the earth that falls from them should be swept away. They should be dried in an open shed, if possible, where they will be only sheltered from the rain; for if dried suddenly by fire-heat, or exposure to the sun, the tubers are apt to wither up; and if dried too slowly without the admission of plenty of air, they will rot. They generally do best kept during the winter in a dry cellar in sand or sawdust; but any dry place will do, which is not too hot. In spring, the tubers are replanted, either in pots plunged in a slight hotbed, about the middle of February, or the beginning of March, or in the open ground in May or June; but the dwarf early-flowering kinds may be planted in the open air in April. When the tall kinds are wanted to flower early, they may be forced rapidly forward, by being plunged into stronger heat, and kept in the hotbed till just ready to flower. If, however, the summer should prove hot and dry, the plants thus forced are frequently attacked by a disease called the curl, which is caused by an insect, called the green bug, that perforates the young leaves, and occasions *them to* wither and shrivel up. All Dahlias are also frequently infested with earwigs, which pierce the flower-buds, and prevent them from expanding.

The beauty of the Dahlia is estimated principally by the shape of the flower, which should be perfectly circular, without any of the petals projecting beyond the others; but if the disc in the centre be seen in a full-blown flower, it is considered as a great defect. As this imperfection disqualifies even a fine Dahlia from competing for a prize, dishonest florists frequently try to remove it artificially, after the flower has expanded. The size and colour of the flowers are considered as of inferior consequence to the form, by professed florists; though, of course, large flowers are generally preferred to



DAHLIA-RINGS.

small ones, and the colours, whatever they may be, should be always clear and distinct, without any blotches, clouding, or muddiness. There are several distinct classes, if they may so be called, of the flowers; as, for example, the Globe Dahlias, the dwarfs, the quilled, &c. As the plants are very luxuriant in their stems and leaves, they require some kind of confinement; and they are generally either tied to cast-iron stakes painted green, or drawn through what are called Dahlia-rings, which are generally made of cast-iron; but as these are rather dear, they may be imitated by fixing three slender stakes of wood, in a triangular form, and forming rings of split willows, which may be purchased of the basket-makers, and tying them to the stakes at regular distances: or the stakes may be pierced with holes, and leaden wire, or slender lathes, passed through them. The dwarf Dahlias may be pegged down so as to cover a bed in a systematic flower-garden; and thus treated, they have a most beautiful effect.

DAISY.—See BELLIS.

DA'LEA.—*Leguminosæ.*— Greenhouse shrubs, with pinnate leaves, and small pea-flowers, greatly resembling those of the wild vetches, but less beautiful. The genus would not have been mentioned here, but on account of its having been the occasion of the name of the Dahlia having been changed by Willdenow to Georgina. (See DAHLIA.)

DAMP STOVE.—A name frequently applied by gardeners to the Bark stove; but more properly belonging to the Orchideous house, the atmosphere of which is kept constantly surcharged with moisture. (See ORCHIDEOUS HOUSE.)

DA'PHNE'. — *Thymelàceæ.* — A genus of beautiful low shrubs, nearly equally remarkable for their elegant and often fragrant flowers, and their bright red, poisonous berries. The best known species of the genus is the common Mezereon (*D. Mezereum*), which is so general a favourite that it has pet names in almost every language. The French call it *bois gentil*, and *bois joli*; the Italians, the fair plant; the Germans, silky bark; and even the grave Spaniards term it the lady-laurel. In our own language, Cowper, one of our sweetest poets in all that relates to sylvan scenery, thus beautifully describes it, alluding to the circumstance of its flowers appearing before its leaves:—

> "Though leafless, well attired and thick beset,
> With blushing wreaths investing every spray."

There are two varieties, one with white, and the other with dark-red flowers. All the kinds are quite hardy, and will grow in any common garden-soil; but they prefer a rich loam, and a shady situation. In the nurseries it is generally propagated by seeds; which are often two years before they come up, unless sown as soon as they are ripe. When young plants are purchased, they should always be transplanted in October, as the sap begins to be in motion about Christmas; and the plants are almost sure to die (or at least to become sickly) if taken up, after the sap has begun to move. The poison is acrid, and the best remedy, if a child should unfortunately eat the berries, is swallowing oil, melted butter, or milk. The Mezereon is a native of the North of Europe, and it is sometimes found wild in England. The common and twin-flowered Spurge Laurels (*D. Laureòla* and *D. póntica*) are evergreen bushy shrubs, with dark-green glossy leaves, and greenish flowers, which they produce about Christmas. The first is a native of Britain, and the latter of Asia Minor. They both require the same culture as the Mezereon, and the common Spurge Laurel thrives under the drip of trees, where few other plants will live. The dwarf Daphnes are generally somewhat tender, with pink fragrant flowers; and *D. odòra*, the Chinese Daphne, is a very fragrant and beautiful greenhouse shrub.

Datu'ra.—*Solanàceæ.* —Strong-growing, large-leaved plants, generally with showy flowers. Most of the kinds are annuals; the best-known of which are the common Thorn-Apple, *D. Stramònium*, now naturalised in England; *D. Mètel*, a dwarf species, common in gardens; *D. ceratocáulon*, a magnificent plant, and *D. Tátula*, the purple-flowered Thorn-Apple. They should all be raised on a hotbed, and planted out in May. The splendid half-shrubby plant, with large, white, tube-shaped fragrant flowers, formerly called *Datùra arbòrea*, is now called *Brugmánsia suavèolens*. This splendid plant may be grown in a large tub in the greenhouse, in heath mould, during the winter; and in May, a pit may be prepared for it about a foot wider in diameter than its tub. This pit should be partially filled with very rotten manure and decayed leaves, and the Datura, being turned out of its tub, and its decayed roots pared off, may be put into the rich compost prepared for it, when it will grow most vigorously. A plant treated in this manner in 1835, expanded 1050 flowers from the middle of May to the middle of September. About the last week in that month the plant was taken up out of the ground in which it had been growing, its roots and its branches were cut in, and it was again placed in a tub, to be kept in the greenhouse till the following spring. It must be observed, that the pit prepared for the Datura must be in soil which is either naturally dry, from being of a gravelly or sandy nature, or which has been well drained; or that the bottom of the pit be filled with broken bricks; in order that the plant must be well and frequently watered while it is growing. Probably if its roots and collar were well protected, it might be left in the open air without injury during winter.

Davie'sia.—*Leguminosæ.*— Australian shrubs, with orange-yellow coloured pea-flowers; which should be grown in a greenhouse, in well-drained pots, and in a soil composed of equal parts of sandy loam and peat. The pots will require to be often watered, but should have no saucers; as the roots are easily withered by drought, or rotted by excess of moisture. The species are propagated by cuttings, struck in sand under a bell-glass, but without bottom-heat.

Day Lily.—See Hemerocallis.

Dead Leaves.—Few persons are aware of the great value of dead leaves to a florist; but the fact is, that when decayed, leaves form the best of all manures for flowering plants. In this state they are called leaf-mould, or vegetable mould; and under one of these names they will be found continually referred to, in all books treating of the culture of flowers. To prepare this vegetable-mould, the dead leaves should be swept up in November, and laid in a heap in the reserve-ground; the heap should be occasionally turned over, say perhaps once a month, and in about a year, or at any rate by the end of the second spring, the mould will be fit for use.

Deadly Nightshade. — *Atròpa Belladónna*, a plant of no beauty, and a deadly poison.

Decaying Leaves. — Many trees and shrubs are very ornamental from the beautiful colours which their leaves assume in autumn, and among these may be mentioned the Ampelopsis or Virginian Creeper, the different kinds of Rhus or Sumach, the Liquidambar, the American Maples, the Rhododendrons, Azaleas, &c. Many large trees, such as the birch, the beech, the oak, and the deciduous cypress, are also very ornamental, from their decaying leaves.

Deciduous Cypress. — Though these trees, in favourable situations, become too large to be included in a work like the present, yet as they are often introduced in shrubberies, when of a small size, it may be here observed, that they never grow large, unless near water. In their native country (North America) they grow in swamps and morasses, and are there from seventy feet to one hundred feet high. When grown in dry soil, they become stunted, and rarely exceed ten feet or fifteen feet high; but their foliage assumes a beautiful red in dying off, instead of its natural yellow. Botanists have had some trouble to know where to place this tree, as it was first called Cupressus disticha, and the generic name was then changed, first to Schubertia, and afterwards to Taxodium.

Delphi'nium. — *Ranunculàceæ.* —The Larkspur. Well-known annual, biennial, and perennial plants, with curiously-cut leaves and splendid flowers, which are either purple, pink, blue, or white, and never yellow. The Siberian Larkspurs are remarkable for the metallic lustre of their flowers, the hue of which resembles that of silver, which has been tarnished by fire; and the Bee Larkspurs are remarkable and interesting for the curious manner in which the petals are folded up in the centre of the flower, so as to resemble a bee, or a large blue-bottle fly. The Larkspurs will grow in any soil or situation; but a rich friable loam, and a situation open to the sun, suit them best. They are improved by the addition of a good deal of thoroughly rotten manure to the soil in which they grow, instead of being injured by it, as is the case with most other flowering plants. The seeds keep good a long time; and those of the annual kinds do best sown in autumn, as when sown in spring they are a long time before they flower. The perennials are propagated by division of the root.

Dendro'bium. — *Orchidàceæ.* — Splendid Mexican epiphytes, which may be grown on the branches of trees, or in a pot suspended from the rafters of the damp stove. They are generally propagated by taking off a joint of the pseudo-bulb, or stem, and planting it in turfy loam, well drained. No water should be given till the plant begins to shoot from below; but in a short time, the green tips of its roots will be seen protruding through the loose soil in the pot, and hanging down over the rim. It is now in a growing state, and if well supplied with water, and kept in a damp atmosphere, it will increase rapidly; but care should be taken that its long roots are not injured, as those that are, will wither away, and never recover. The flowers hang down in long spikes, and have a splendid appearance.

Deptford Pink. — *Diánthus Armèria.* — An annual species of Dianthus, with clusters of small pink, scentless flowers, something like those of Lobel's Catchfly. A native of Britain, generally found in gravelly soil, and growing freely in any garden, where the soil is not too rich.

Deu'tzia. — *Philadelphaceæ.*— Climbing, or rather ascending, shrubs, with compound panicles of beautiful white flowers. They will thrive in any light soil in the open ground; but as they require a slight protection during winter, they are generally grown in pots, and kept in the greenhouse. *D. scabra*, the most common species, takes its specific name from the roughness of its leaves; which, in its native country, Japan, are said, by Thunberg, to be used by the cabinet-makers in polishing the finer kinds of wood.

Devil in a bush.—See Nigella.

Devil's Bit.—*Scabiòsa succísa.*—A kind of Scabious, quite hardy, and growing in any soil or situation. It was formerly supposed to have great medicinal virtues; and hence, says the legend, the Devil, envying mankind such a treasure, attempted to destroy it, by biting off a part of the root, which appears as though a part of it were bitten off at this day.

Dewberry.—*Rùbus cæ̀sius.* See Rubus.

Dia'nthus. — *Carophyllaceæ*, or *Silenaceæ.*—A genus of perennial and herbaceous plants, containing several beautiful and well-known flowers. The most popular perhaps of these is the Carnation (*Diánthus Carophýllus*), which is occasionally found in a wild state in Britain on old walls, particularly on the ruins of Rochester Castle, &c. In a cultivated state, the Clove Carnation may be called the breeder, or normal form, as it bears about the same relation to the variegated Carnations as the self-coloured Tulips and Auriculas do to the named varieties of those plants. The varieties of Carnations are divided into three kinds: the Flakes, which are striped with broad bands of two colours; the Bizarres, which are striped, or streaked, with three colours; and the Picotees, which are much the hardiest, and are only bordered with a narrow margin of some dark colour, or dotted with very small, and almost imperceptible spots. Carnations should be grown in a rich loam, mixed with sand or peat to keep it open, and a little rotten cow dung, or vegetable mould to enrich it. They do best in pots, and the earth should be pressed into the pots as firmly as possible; more so, indeed, than for any other plant. The plants raised from layers should be separated from the parent in August, and they may be potted three in a five inch pot. The pots should be well drained, and the plants frequently watered, till about the middle of October, when the watering should be gradually decreased. The layers, when first potted, may be kept in the open air; shading them, for a few days after potting, from the sun; and putting a hand-glass over them, if there should be apprehended any danger of severe frost at night, though a little frost will not hurt them. About the middle of November, the plants should be removed to a greenhouse, or shed, where they should be kept entirely in the shade, merely protected from the frost, as they will bear a considerable degree of cold much better than too much heat. Here they may remain till March or April, according to the season, when they should be repotted, and, after a few days, turned into the open air. In May they may be either planted out in beds, or removed to larger pots for flowering, which they will do in June and July. When the buds have formed, the plants should be well watered morning and evening; and, in the evening, they should be syringed over the leaves, always waiting till the sun has gone down. The principal points of beauty in a Carnation are, that the stem should be strong and erect, the calyx well and regularly opened, the flower round, with the petals regularly disposed, the largest on the outside, and gradually decreasing in size to the centre, and the colours clear and distinct, those with a white ground being preferred. The stripes should also be broadest at the margin of each petal. As the calyxes of Carnations are very apt to burst on one side before they open on the other, and as this spoils the shape of the flower, many cultivators gently divide the sepals with a pin, as soon as the buds are fully swelled; and others slip a round piece of card-board, with a hole in the centre, over the bud while it is yet quite small, and push it up over the calyx, so as to force it to open first at the top. This piece of pasteboard is kept on after the expansion of the flower, and serves to keep the petals in their proper places. Others tie a strip of bast-mat round the lower part of the buds, to prevent them from opening improperly. The flower is also furnished with a stake to tie it to, and a paper or tin cap, to shade it from the sun. June and July are the months for making layers. For this purpose, the outer strongest, and lowest shoots of the plant should be preferred; and each shoot should be cut about half through, in a slanting direction, at a joint. A furrow should be made in the ground an inch or two deep, in which the cut stem should be buried, and fastened down with a bit of hooked twig, so as to have the wounded part completely covered, and the end of the layer upright, an inch or two out of the earth. The layer should be moderately watered as soon as it is made, and the plant should be shaded after the operation. It may be observed with relation to Carnations grown in pots, that as their stems are generally very brittle when they are moist and succulent, it may be as well to set the pot in the hot sun for about an hour before the layer is made, to render the stalks flaccid. Carnations are also propagated by cuttings (see PIPINGS), and some sorts are raised from seed.

The Pink (*Diánthus plumárius*) is by some supposed to be a variety of the Carnation; but others make it a distinct species, though it does not appear to be known in a wild state. There are many kinds, but only what are called the laced pinks rank as florist's flowers. The laced pinks, to be esteemed by florists, should have their flowers about two inches and a half in diameter; and the petals should be white, with rose edges, and a broad ring of rich dark purple or crimson, as nearly black as possible, in the centre; the colours being all strongly marked, and quite clear and distinct. The culture of the laced pink is exactly the same as that of the Carnation; but the common pinks may be planted in the open garden, and treated exactly the same as the other hardy perennial border flowers. The Tree-pink (*D.arboreus*) is merely a woody kind of Carnation; and the Mule-pink is a hybrid between the Carnation and the Sweet William. They both require only the common treatment of border flowers. The leaves of all the kinds of Pinks and Carnations are called by gardeners the grass.

The greenhouse species of Dianthus grow freely in light rich mould, with a moderate allowance of air and water; and they do not require any particular care in their culture. They are all very ornamental, and they are propagated by cuttings, which strike readily, and do not require bottom heat.

For the culture of *Dianthus barbatus*, see SWEET WILLIAM. *D. chinensis*, the Chinese Pink, is generally treated as a hardy annual; but it may be preserved in dry soil for two or three years.

DICOTYLEDONOUS plants are those,

the seeds of which separate into two cotyledons, or seed-leaves, when they vegetate: and this class comprehends three-fourths of all the known plants in the world. They have all reticulated leaves, that is, leaves the veins in which appear like net-work when held up to the light; and the ligneous species have the thickness of their stems increased every year by successive layers of new wood, deposited on the outside of the old wood, immediately under the bark. In all these points, and many others less conspicuous, they differ from the monocotyledonous plants, or those the seeds of which have only one seed-leaf, or cotyledon.

Dicta'mnus.—*Rutàceæ.*—Fraxinella. There are two species, the purple and the white, both hardy perennials, and both natives of Germany. The leaves have a pleasant smell, like lemon peel, when rubbed, and the plant emits a phosphoric vapour, which may be easily ignited by a candle, and burns like gas. The flowers are very ornamental; and the plants will grow in any common garden soil, and in any situation not immediately under the drip of trees. They are increased by division of the root.

Didi'scus.—*Umbelliferæ.*—The beautiful Australian plants, sometimes called by this name, and sometimes by that of Trachymènè, are half-hardy annuals, that require to be raised on a hot-bed, and not planted out till May or June. In very cold, exposed situations, they are generally grown in pots, and kept in the green-house; but they never flower so well as in the open ground. The best way to grow them is to sow the seed in autumn as soon as it can be procured from the seed shops, on a slight hot-bed, to pot the plants as soon as they have formed their second pair of leaves, and to keep the plants in a frame or green-house, shifting them occasionally, till the following spring, when they may be planted in the open ground in a light rich soil, and they will flower beautifully.

Diervi'lla.—*Caprifoliaceæ.*—A little North American shrub, with yellow flowers something like those of the honeysuckle in shape. It was formerly considered to belong to Lonicera. It is very hardy, and will grow in almost any soil or situation, sending up abundance of suckers, by which it is easily increased.

Digging.—The art of pulverising the ground so as to reduce it to a fit state to be penetrated by the roots of plants; and also to render it pervious to the rain and air, without the aid of which neither seeds could vegetate, nor trees grow. Digging, (or ploughing, which is the same thing on a larger scale,) is the first operation performed by man on a barren waste when he takes it into cultivation.

Digita'lis.—*Scrophularinæ.*—The Foxglove. If this plant were not a common British weed, it would be thought very ornamental; and, in fact, the Teneriffe species, *D. canariensis* L., (*Isoplexis canariensis* G. Don), with yellow flowers, and *D. sceptrum* L., (*I. sceptrum* G. Don,) with orange flowers, are favourite green-house shrubs. They should be grown in a mixture of loam and peat, and may be propagated by cuttings or seeds which they ripen in abundance. The hardy herbaceous species which modern botanists have left in the genus Digitalis, are mostly natives of the south of Europe, and are all ornamental. They require a light rich soil, and are propagated by seeds.

Dillwy'nia.—*Leguminosæ.*—Australian shrubs with heath-like leaves, and pea-flowers, which are generally scarlet and orange. They should be grown in pots well drained, and in a mixture of peat, loam, and sand, and they should be well and regularly watered; but no water should ever be allowed to stand in the saucers; if their pots should have any, but they are much better without. They are propagated by cuttings, which should be struck in sand under a bell-glass.

Dimorpho'theca.—*Compositæ.*—Professor De Candolle's new name for the Cape Marygolds, formerly called *Calendula pluvialis* and *C. hybrida.* (See Calendula.)

Dionæ'a.—*Droseràceæ.*—Venus's Fly-trap. A curious little American plant, nearly allied to the common Sun-dew, so often found in boggy meadows in different parts of England. (See Dro'sera.) *Dionæ'a muscípula* has a scaly root, almost like a liliaceous bulb, and it sends out few fibres; it is therefore very difficult to keep, but it does best in a green-house, grown in moss, with a little mould at the bottom of the pot, and the pot kept standing in water and covered with a bell-glass during the heat of the day. The glass is generally taken off towards the evening, and the plant allowed plenty of fresh air, but some gardeners do not think this necessary. It is supposed that the flies this plant catches, are useful in nourishing it, though not essential to its support; and the experiment has been tried of feeding it with very small pieces of raw meat, which in a few days appeared surrounded by a kind of mucus and half-digested. In the like manner, the remains of the bodies of flies are often found in the leaves of this plant, and those of the common Sun-dew, though both plants will thrive, if kept sufficiently moist, without such nourishment.

Dio'sma.—*Rutaceæ.*—Cape shrubs with hair-like roots, which require to be grown in pots in a green-house, or room, in sandy peat, well drained, and frequently watered. Like all the Cape shrubs, they are easily killed by too much or too little water; and should never be suffered to stand with water in a saucer, or to get too dry. They have a very peculiar smell, which some persons like, and which is said to be very wholesome; but which is generally thought to be very disagreeable, and which remains in gloves or any other article of dress that may have touched the plant for a long time. The Hottentot belles are said to use it as a perfume. The plants have heath-like leaves and small but pretty flowers; they are propagated by cuttings which root freely in sand under a glass.

Di'placus. — *Scrophularinæ.* — The Monkey-plant. The shrubby kinds of Mimulus, with yellow or scarlet flowers; which should be grown in a mixture of sandy loam and peat. They are natives of California, and like all the plants from that country they are easily killed by the sun striking on the collar of the root; they likewise suffer severely from drought, or too much moisture. They are propagated by cuttings struck in sand without bottom heat.

Di'rca.—*Thymelaceæ.*—Leatherwood. This is the smallest of trees, as though some of the kinds of willow are of still lower growth, they are too herbaceous in the texture of their stems, to be legitimately entitled to the rank of trees. The Dirca, on the contrary, is as completely a tree as an oak, though it seldom grows above three feet high. It is a native of America, and requires a marshy soil, or to be grown in peat kept constantly moist.

Dittany of Crete.—*Oríganum Dictámnus.*—A kind of marjoram, with pink flowers, a native of Candia, which is quite hardy, but should be grown in rich mould. On the continent, a branch of it hung up in a room, is said to keep away fleas and other vermin.

Division.—Plants are said to be propagated by division when they are taken up and separated into portions; each portion having part of the root and one or more buds attached, if in herbaceous plants; or a root and part of a stem if in shrubs, or other ligneous plants. Hence, almost all herbaceous plants may be propagated by division, as they generally send up many stems from their roots; and also all those shrubs or low trees that send up suckers. In one sense almost all ligneous plants may be said to be propagated by division; as cuttings are divisions of the stem or branches. Indeed, as every bud has the power, like a seed, of sending a shoot upwards, and roots downwards from its base, every plant may be divided into as many new plants as it has buds; but the common application of the term division is to the dividing of those roots which send up many stems or suckers.

Dodder. See Cu'scuta.

Dodeca'theon.—*Primulaceæ.*—The American Cowslip. A very pretty plant, to which Linnæus gave a very strange name: Dodecatheon signifying the twelve Roman divinities. The plant is a native of Virginia, and it is generally considered quite hardy; but it is very difficult to keep. It should be grown in the open ground, in a sandy loam, in rather a shady situation, and kept moist. One reason of its being lost is, that if the roots are once suffered to become too dry, they wither; and when moisture is given, they rot instead of reviving; and another reason is, that as the stem and leaves die away in winter, the root is often dug up and thrown away as dead, by jobbing gardeners, who are unacquainted with the plants of the garden they are working in. To prevent this, a mark of some kind should always be fixed in the ground in small gardens; or when a new gardener is employed, its situation should be pointed out to him. There are several garden varieties.

Dog-tooth Violet — *Erythrònium dens canis*, is a pretty bulbous-rooted plant with spotted leaves and purple flowers. There is a variety with white flowers; and *E. Americàna* has large dark yellow flowers. The European kinds will grow in any common garden soil, and do not require taking up; but the American species, which is much the handsomest, is apt to waste its strength in producing roots instead of flowers. For this reason, it does best grown in well-drained pots, in rather poor soil, or what is better, in sandy peat.

Dog-wood. See Co'rnus.

Do'lichos. — *Leguminosæ.* — Climbing annual and perennial plants, from the East and West Indies, generally with purple or yellow pea-flowers. The pods and seeds are eatable, and in some cases also the roots. Soy is made from the seeds of one of the East India species. They are generally grown in a stove; but most of the kinds will thrive in green-house heat, particularly if planted in the free ground in a conservatory, and trained up a pillar, or over trellis-work. The soil for all the species should be sandy loam. *D. Láblab* L., (*Lablàvia vulgàris* D. Don,) the Egyptian Bean, has splendid dark purple flowers, and will grow well in the open air, if treated as a half-hardy annual.

Doro'nicum.— *Compósitæ.*—Leopard's Bane. Showy perennial plants, with large dark yellow flowers, which look very well in a border, and which will grow with scarcely any care in any common garden soil. One species, a native of Siberia, has white flowers.

Dortma'nnia.--*Lobeliàceæ.*--Professor De Candolle's new name for the common British species of Lobelia. It is an aquatic plant, and is generally found in ponds, or small lakes. There is an American species of the same habits, and both have blue flowers.

Dorya'nthes.—*Amaryllidàceæ.*—*D. excélsa*, the only species known, is a splendid Australian plant, sending up a flower-stalk twenty or thirty feet high, crowned with a head of bright scarlet flowers. The plant is herbaceous, and it requires a peaty soil and green-house heat. It dies as soon as it has produced its flowers.

Dory'cnium.—*Leguminòsæ.*—A genus of little hardy plants, separated by Tournefort from the Lotus, or Bird's-foot Trefoil, and growing freely in any common soil. They are most suitable for rockwork.

Double Dwarf Almond. (See **Cerasus.**)

Double Flowers are particularly desirable to cultivate in gardens, not only from their beauty, but from the comparative certainty that exists of their producing their flowers every year, the plant not being weakened by ripening seed. This is peculiarly the case with the double-flowered trees and shrubs; the double-flowered Peach, the double-flowered Cherry, and the double-flowered Hawthorn never failing to produce abundance of blossoms every year so long as the tree continues in health; while the single-flowered kinds generally fail in producing an abundant crop of blossoms every second or third year. This observation does not apply so forcibly to semi-double flowers, as they frequently ripen seeds.

Dra'ba. — *Cruciferæ.* —Willow-grass. Very low plants, admirably adapted for rockwork, as they are generally found in a wild state in the fissures and crevices of rocks and mountains. They have generally white or yellow flowers, and should be grown in sandy soil, on a bank, or in any open situation, exposed to the sun.

Dracæ'na.—*Asphodelaceæ.*—The Dragon-tree. Eastern trees and shrubs with the habit of palms. They require a stove in England, and to be grown in peat and loam. The tooth-brushes called Dragon's root, are made from the root of the tree species cut into pieces, about four inches long; each of which is beaten at one end with a wooden mallet, to split it into fibres.

Dracoce'phalum. — *Labiatæ.* — Dragon's Head. Several species of this genus are well known as garden flowers; particularly *D. Moldivica*, the Moldavian Balm, a hardy annual, and *D. canariénse*, the Balm of Gilead, a greenhouse shrub, which should be grown in rich mould, and is propagated by cuttings. Some of the perennial species, such as *D. canéscens*, *D. grandiflòrum* (a native of Siberia), and *D. austriàcum*, have large and splendid blue flowers; all these are quite hardy in any common garden soil, and they are all propagated by seeds or division of the roots.

Draining.—Draining in the open garden is effected either by surface-gutters, into which the water may run, which does not sink into the soil; or by underground channels, formed by earthenware tubes called draining-tiles, or by tunnels built of brick or stone, or by open drains partially filled with small pebbles, broken stones or bricks, or even by faggots, branches of trees, or other similar materials, which will preserve a porous channel through which the water may percolate. The draining-tiles or other materials should not rise nearer to the surface than the common depth of dug ground, say about a foot or eighteen inches; and they need not be placed deeper than the usual depth of trenched ground, say between two and three feet. Plant-pots and boxes are drained by placing crocks or potsherds, shells, small stones, or cinders, over the hole in the bottom of the pot; and in large pots these materials may be covered with any fibrous matter, such as old matted roots, loose moss, pieces of turf, &c., which will prevent the earth from mixing with the potsherds, stones, or other substances employed for draining. The great object of draining is to prevent the stagnation of water about the roots, which rots the spongioles or elastic extremities of the fibres, and soddens or consolidates the earth in such a manner that the roots cannot penetrate into it, or if they do, that they decay for want of air. For most plants the best materials are old pots, broken into pieces little more than an inch in diameter, which gardeners call crocks or potsherds, as from their porous nature they form reservoirs of moisture, which will prevent the plants from ever becoming too dry. Cinders, on the contrary, are to be preferred for delicate or succulent-rooted plants, as the crocks retain so much moisture as to be injurious to the roots of these plants. The Australian and Cape shrubs should have their pots drained with two or three layers of crocks, as these will retain sufficient moisture to prevent the roots from withering, which even an hour or two of perfect dryness would occasion them to do.

Drilling.—Sowing seeds singly in furrows made in straight lines; a mode of sowing very useful in culinary crops, but seldom practised with flowers, which scarcely ever require to be hoed up.

Dro'sera. — *Droseràceæ.* — The Sundew. British, American, and Australian plants, with hairy leaves *curious* flowers, which require to be grown in moss, or peat, or heath mould, kept moist, and during the heat of the day covered with a bell-glass. The hairs on the leaves support drops of water in the hottest weather, and being very irritable, close on any insect that may chance to touch them, like those of *Dionæa muscípula*, Venus's Fly-trap, the leaf bending over the insect, and holding it in prison. The Italian liqueur called Rossoglia is said to take its name from one of the species being used in its composition. The Australian species from the Swan River, seeds of which have been introduced by Capt. Mangles, promise to be very beautiful. All the kinds of Drosera appear to be very short-lived; and probably will not live longer than three or four years, whatever care may be taken of them.

Dry Stove.—A hothouse or plant structure, for tropical plants which do not require a moist heat, such as some of the kinds of Cacti, or other succulent plants. The temperature of the dry stove should not be less, even in winter, than between 55° and 65°; but in summer it may be from 10° to 20° higher. The plants are placed on shelves or benches; and they are grown in pots of sandy peat, or very porous soil, thoroughly drained, which in general should be kept much drier than the soil of plants, either in the greenhouse, or in the moist or bark stove. The plants generally grown in a dry stove, are the different species of Melocácti, Epiphýllum, Céreus, Euphórbia, Stapèlia, Agàve, Mesembryánthemum, Crássula, Sèdum, Sempervivum, Laròchea, and several sorts of bulbs, such as Lachenália, O'xalis, &c.

Dumb Cane. — *Calàdium seguinum.*—A kind of Arum, requiring a bark-stove, and more curious than beautiful.

Duvau'a.—*Anacardiaceæ*, or *Te-*

rebinthaceæ.—Chilian shrubs, which prove nearly hardy in the climate of London. They were called *Amyris* by Cavanilles, and *Schinus* by Ortega, both professors of botany at Madrid; and they are occasionally found under these names in gardens and nurseries. The commonest kind, *D. dependens*, Dec., (*Amyris polygama*, Cav.,) withstood the winter of 1837-8, in the Horticultural Society's Garden, with very little protection. The leaves of plants of this genus, if thrown upon water, will start and jump about in a very extraordinary manner; and they smell strongly of turpentine. The plants should be grown in a light dry soil, and trained against a south wall, where they can be protected by a thatched coping during winter. The flowers, which are white, are produced in small spikes, and they are succeeded by dark-purple berries.

Dwarf Fan-palm. — *Chamærops humilis.*—This plant is the hardiest of the palm tribe, and it will succeed if planted out on a lawn, and slightly protected during severe frosts. It should be grown in rich mould, well drained, and occasionally watered. When planted out on a lawn, a pit should be dug for it about two feet deep; at the bottom of which should be two or three layers of pebbles, to ensure drainage, and then the pit filled up with rich sandy loam. Thus treated, and protected during severe winters by a moveable frame of canvas, stretched on hoops, or of basket-work, it will grow vigorously, and live many years.—(See Protecting.)

Dwarfing.—In some cases, where there is very little room, it may be desirable to know how to obtain dwarf trees; though generally speaking they are, like all unnatural objects, in bad taste, and rather disagreeable than pleasing. Wherever Chinese buildings are introduced, however, a few dwarf stunted elms in China vases should be placed near them; as in China it is said that no garden is considered complete without several of these little monsters. The mode of making them is to take a ring of bark off one of the branches of a full-grown elm-tree, and to surround it with earth wrapped in moss, which should be kept constantly moist, by water being thrown on it several times a day, or by a vessel being suspended over it, so contrived that the water may ooze out a drop at a time, and thus be continually and regularly falling on the moss. In the course of a few weeks, the branch will have thrown out roots; and when this is supposed to be the case, it should be detached from the parent tree, and planted with the moss still round it in a small pot in very poor soil; as soon as it begins to grow, it should be shifted into another pot a little larger; and this shifting should be repeated several times, into larger and larger pots, always using poor stony or gravelly soil, and giving the plant very little water. Thus treated, the plant will soon become a little stunted tree, bearing all the marks of old age; and looking like a poor decrepit old man, bent double with age. It is obvious that other forest-trees might be dwarfed in the same manner; so that a miniature forest might easily be formed, the oaks assuming a gnarled and rugged character, and bearing acorns, and the pines and firs with rough furrowed bark, and covered with cones, and yet the whole not above two feet high.

Another mode of dwarfing ligneous plants is employed to throw them into flowers or fruit. It is found that many stove-plants only bear fruit at the extremity of their branches, and that our hothouses are not large enough to permit them to attain the requisite size. Cuttings are therefore made from the points of the shoots; and when these grow, other cuttings are made from their shoots. In this way small compact plants are obtained, the wood of which may be more easily ripened than that of large plants, and which seldom fail to produce flowers and fruit. Professor Van Mons practised this mode of dwarfing to obtain fruit from his seedling pears sooner than he could otherwise have done.

Another mode of dwarfing trees and shrubs, is by grafting them on other low-growing species of the same, or some nearly allied, genus: thus, for example, the common horse-chestnut, ***Æsculus Hippocastanum***, may be grafted on ***Pàvia hùmilis***, which does not grow above three or four feet high; the Azarole, or any of the large American thorns, might be grafted on ***Cratægus parviflora***, or ***C. viridis***, which are about two feet high; and the common British, or any of the large-growing American oaks, on the Bear oak, ***Quercus Bannisteri***, or ***ilicifòlia***, which grows to the height of about three feet.

Herbaceous plants, whether annual or perennial, may be dwarfed, by growing them first in very small pots, and shifting them into others pots, gradually increasing in size every time; taking care that each pot shall be well drained, and that the soil used to fill up the pots shall be a rich sandy loam. Thus treated, and supplied with abundance of water, which is not suffered to remain round the roots, and kept in an open situation, where they can have plenty of light and air, and not be exposed to cold winds, all herbaceous plants will become bushy and compact, and will produce flowers at the extremity of every shoot; while on the contrary, if suffered to remain in small pots, they will become drawn up, with weak naked stems, and produce comparatively few flowers.

E.

Earths.—Most amateur gardeners confound the words earth and soil; but they are quite distinct. There are only three primitive earths,—viz., lime, sand, and clay; and these, by the admixture of other substances, and particularly of decayed animal or vegetable matter, become soils. Thus lime, by absorbing carbon, changes to chalk, and becomes the basis of all calcareous soils; and clay, mixed with a little sand, and decayed animals and vegetables, becomes loam. When sand predominates in this composition, or when pure sand is added to it, the soil is called sandy loam, and this is the very best of all soils for vegetation; and when chalk or lime is added, instead of an extra proportion of sand, the soil is called calcareous loam, and is admirably suited for culinary vegetables, &c., and some kinds of flowers. Gravel is a kind of coarse sand; and sandstone, sand in a solid state. Peat is not properly an earth, but decayed vegetable matter, which has been saturated with water while the process of decomposition was going on.

Earth Pea.—***Láthyrus amphicárpos.***—An annual pea, which forms part of its flowers and pods under ground; and which, though not very beautiful, is often cultivated for its singularity. It is a hardy annual, and should be sown in March or April.

Earwig. — ***Forfi'cula auriculàris.***—A well-known insect, that, by a singular chance, has obtained a bad character for the mischief that it does not do; while that which it really does, passes comparatively without notice. Many persons destroy earwigs whenever they see them, from a fear of their creeping into the ear, and, by eating through the drum, occasioning deafness,—though this is what they cannot do; while but few persons, except florists, are aware of the great mischief that they do in flower-gardens, and that they should be destroyed on that account, with as much care as slugs, snails, or wood-lice. They are particularly fond of attacking flowers in the bud; and they destroy, in this manner, great numbers of Dahlias and Carnations. They also attack bulbous-rooted plants, and all flowers that have plenty of petals. Many expedients have been devised to catch these troublesome insects, and, among others, troughs of water have been placed round particular plants. These are, however, of no avail; as the earwigs are furnished with wings, though they are so delicate in their texture, and fold into such little space, as to be rarely seen. Earwig-traps are also formed of hollow pieces of cane, or rhubarb-stalks, and sometimes of wood, or even of tin. The earwigs feed during the night, and creep into these hollow tubes in the morning, to avoid the heat of the sun; and consequently may be shaken out and killed, at any time during the day. The earwig differs in its habits from other insects, in regard to its young; as it sits on its eggs, and broods over the young ones, like a hen over her chickens: most other insects, on the contrary, die as soon as they have laid their eggs, which they leave to be hatched by the sun, and the young to take care of themselves.

Eccremoca'rpus. — *Bignoniaceæ.* —*E. scàber*, Ruiz et Pavon; (*Calampelis scàbra*, D. Don.)—A half-hardy climber, of exceedingly vigorous growth, producing a great profusion of orange-scarlet flowers, and ripening abundance of seed. It will grow in any common garden-soil; and if cut down to the root in autumn, and covered with dead leaves, straw, or anything to preserve it from the frost during winter, it will shoot up again the following spring. It may be propagated by cuttings struck under a bell-glass; but it ripens seeds so freely, that it is most easily raised from them. They should be sown in autumn as soon as they are ripe on a slight hotbed; and the plants, which should be kept in a frame or greenhouse, should be shifted two or three times till they are ready for planting out in April or May. They should be watered and shaded for a day or two, till they seem established; but after that they will require no farther care, except a little training, if they are wanted to cover any particular part of the wall, &c.

Echinocactus. — *Cactaceæ.* — Round-shaped Cacti, which take their name from their resemblance in form and spines to a curled-up hedgehog. There is, however, a great degree of confusion about them, and some species that are called Echinocacti by some botanists, are called Melocacti by others; and those with very long tube-shaped flowers have lately been called Cereus, because their flowers in their construction resemble those of the other plants belonging to the genus *Cèreus*. Whatever botanic name may be given to them, all the round-shaped, ribbed, spiny, or porcupine Cacti, require the same treatment; that is, to be grown in vegetable mould, mixed with pounded bricks, or lime rubbish, and allowed bottom-heat where practicable. The pots should be drained with cinders; and the plants should be frequently watered, but the water should never be given overhead, as it will rot the centre, where there is an indentation, if suffered to lie there, and this can hardly be avoided if water is poured all over the plant. They are propagated by seeds, which should be sown in silver sand, and placed in a warm shaded situation; or by cutting off the top of the plant, and after letting lie a day or two to dry, planting it in silver sand, and not watering it; when it will soon throw out shoots, while the other part of the plant will form a new top. The young plants, when raised from seed, should not be watered when transplanted, for several days after transplantation. The flowers of all the porcupine Cacti are very ornamental; and those which are considered to belong to Cereus, often have the tubes of their flowers a foot long.

E'chinops. — *Compósitæ.* — The Globe Thistle. Hardy annual, biennial, and perennial plants, generally with blue flowers; that require only the common culture of their respective kinds, and which will grow in almost any soil and situation.

Echi'tes—*Apocyneæ.*—Beautiful stove-climbers, which grow freely in a mixture of sandy loam and peat; and which should be trained up the pillars, and under the rafters. They are propagated by cuttings, which strike readily.

Echium. — *Boraginàceæ.* — Viper's Bugloss. Perennial, biennial, and annual plants, generally with rich dark-blue flowers; though some of the kinds that are natives of the Cape of Good Hope and the Canaries, have red, white, or violet flowers. They all require a light soil, and will grow well in either sandy or peaty loam; and they are easily propagated by seeds or division of the root.

Edgings are lines of plants, generally evergreens, to separate walks from beds or borders. The plant in most universal use for this purpose in British gardens is the dwarf Box; a low evergreen shrub, which retains its leaves for two or three, and even four years, and bears clipping, so as to be kept not more than three or four inches high, two inches or three inches broad at the base, and one inch at top. Being once planted, if clipped every year, it will retain its form and efficiency as an edging, for six, seven, or more years. In planting it, the first operation is to prepare the soil by digging it, and reducing it to an even surface, parallel to what is intended to be the surface of the gravel, or material of the walk, on the one side, and of the bed, or border, on the other. The next is to stretch a garden-line, so as to indicate the direction in which the edging is to be planted; the next is to cut out a narrow shallow trench with a spade, on the side of the line next the walk. Then the Box is evenly distributed along this trench, with the tops of the plants about an inch above the soil; and the earth is drawn in over the roots of the plants, and firmly pressed to them with the feet, so as to reach within about three inches of the tops of the plants. After this, the gravel is laid on so as to cover the soil about two inches, and to leave one inch of the Box above the gravel on one side, and above the soil on the other. It is particularly to be observed, that the trench must always be made on the side next the walk, in order that the soil may be placed about the roots of the plants, and the gravel laid over it; otherwise, if the trench were made on the border side, the Box would lean against the gravel, and the roots, being entirely covered with soil, would grow with so much luxuriance, that the plants would be with difficulty kept within bounds by clipping. Other plants which are used for edgings to walks and beds, are, Thyme; the common Heath; Thrift, or Sea Pink; Saxifrage of different kinds; the Sweet Aly'ssum; and, in general, every herbaceous plant that is of low compact growth, and retains its leaves all the year. Double edgings are sometimes formed, by planting a line of evergreen plants next the walk, and within it, at about six inches' distance, a line of bulbous-rooted plants, such as Crocuses, Snowdrops, Scillas, Hyacinths, Aconites, Dwarf Narcissus, &c. In general, the great art in planting and managing edgings is, to keep a complete line of separation between the gravel of the walk and the soil of the border; for which purpose the plants in the edging must always touch one another so closely as never to let the gravel and the soil come in contact.

Edgings to beds and borders are also formed of other materials, such as lines of bricks, tiles, or slates, or of narrow strips of stone, or even of wood. In general, however, edgings of this kind have a meagre appearance, especially in small gardens, though they have this advantage, that they do not harbour snails, slugs, or other vermin. In architectural flower-gardens, near a house, where the garden must necessarily partake of the character of the architecture of the building, stone or brick edgings are essential, and they should be formed of strips of curb-stone, bedded on stone or brickwork, so as never to sink. These stone edgings should never be more than two or three inches wide, and they should not rise above the surface of the walk more than two inches; otherwise, when they rise higher, unless the walk be of more than the usual breadth, they give it a sunken appearance, which is very unpleasant to the eye. In forming edgings of brick, the bricks should generally be placed in the ground endways; and the best effect is produced by using bricks that have been moulded with round ends on purpose. Edgings of tiles, to be kept securely in their places, should be set in concealed brickwork; otherwise they are apt to get out of place, and to have a ragged and temporary appearance. The same may be said of edgings of slate; and, in general, these kind of edgings are much improved by a line of evergreen plants, planted close to them on the bed, or border side. Edgings of boards should be of oak, for the sake of durability; and they should be kept securely in their places by concealed posts, driven into the ground, to which the boards should be nailed, beneath the surface of the walk.

Much of the beauty of all gardens, whether useful or ornamental, depends on the neatness and high keeping of the edgings; for whatever may be the state of the boundary fence of the gravel or pavement of the walks, and of the soil or plants of the borders, if the edgings have an uneven, ragged appearance, or if the plants be either too large or too small, the garden will be at once felt to be in bad keeping.

Hitherto nothing has been said of edgings of turf, because these are chiefly applicable to pleasure-grounds. To form them, the ground is first dug, and then levelled, so as to be about the intended height of the gravel, or half an inch below it. It is then firmly beaten, so that it may not sink afterwards; and the turf, which should be procured from a smooth, even, pasture, is laid down, and rolled or beaten with a broad flat mallet, fixed in a long handle, called a turf-beater, so as to be rendered perfectly firm and even. The breadth of turf-edgings should seldom be less than two feet, because less than this width cannot be conveniently mown. After the turf has been laid down, a garden-line should be stretched along its margin, and the edges should be cut smooth with a spade or a turfing-iron. The walk may now be filled in with gravel to within an inch of the upper surface of the turf, and the soil of the border may also be raised to the same height. In the management of the turf afterwards, the greatest care must be taken not to cut the edgings of the turf so as to show a line of earth, which always produces a raw and harsh appearance. Generally speaking, only the grass should be clipped close on the side next the walk; and if it be found that the roots of the grass have penetrated into the gravel, so as to make the use of the turf-cutter necessary, the edges of the cut turf should be afterwards gently pressed down, so as to make the grass slope gently up from the walk. This slope will, however, be very trifling; as if the walks are kept properly full of gravel, they ought to be as nearly as possible on a level with the turf. These remarks will, of course, apply to all cases where there is a gravel-walk through, or round a lawn; or, in short, to all points of junction between gravel and grass.

Edwa'rdsia.—*Leguminosæ*.—Half-hardy low trees and shrubs, with pinnate leaves, and very curiously-shaped flowers (which are of a dark golden yellow), and seed-pods. The plants will grow well in the open air, against a wall, if protected during winter by a thatched coping. The soil should be sandy loam, and kept moderately dry, as too much moisture to the roots is apt to make the leaflets turn yellow and drop off. The species are all natives of New Zealand; and, on their first introduction, they were supposed to belong to the genus *Sophòra*. They are propagated by cuttings, in sand, under a bell-glass.

Egg Plant.—*Solànum Melongèna*, L.—A tender annual, nearly allied to the Tomato, the fruit of which, when white, greatly resembles an egg. There are some varieties with violet-coloured, and some with dark purple fruit. All the kinds are eatable, if dressed like the Tomato. The seed should be sown in light rich earth, on a hot-bed, in February or March, and the young pricked out into pots, and shifted several times, till they are ready to flower. They may then be removed to the hot-house, or greenhouse; but they will not ripen their fruit without a good deal of heat.

Elæa'gnus.—*Elæagnàceæ*.—The Oleaster, or Wild Olive. Curious-looking low trees, or shrubs, with bluish-green leaves, covered with a white silky down, that gives them a silvery look in the sun-beams. The flowers are small and tube-shaped; they are of a pale yellow, and rather fragrant. The fruit resembles the Olive in shape, and is of a dark reddish brown. There are only two hardy species, one of which is a native of the Levant, and the other of America; they both require a light rich soil, and a somewhat sheltered situation; and they are both propagated by seeds or cuttings. The Nepal species require a greenhouse.

Elder.—See Sambu'cus.

Elephant's Foot.—See Tamus.

Elichrysum.—See Helichrysum.

Elsholtzia. — *Labiatæ*. — A plant of no beauty, the flowers of which somewhat resemble those of the common Mint, but are smaller and less conspicuous. The plant is only noticed here from the resemblance of its name to that of the Eschscholtzia, which induced Dr. Lindley to propose to change the name of the latter genus to Chryseis; in the same way as it was proposed to change the name of the Dahlia on account of its similarity to Dalea. As, however, the German names are found to be quite as distinct as Dahl and Dale, the Eschscholtzia retains its first appellation.

Emi'lia.—*Compósitæ.*—Cassini's name, adopted by Professor De Candolle, in his new arrangement of the *Compósitæ*, for the *Cacàlia coccínea*, *C. sonchifòlia*, and *C. sagittàta* of Linnæus.

Empe'trum,—*Empetreæ.*—The Crow Berry. Little heath-like plants, with pretty flowers and very showy berries, adapted for growing on rock-work. They should be grown in peat soil, and kept rather dry.

Enchanter's Nightshade.—See Circæa.

Endogens.—Monocotyledonous plants. The trees belonging to this division, such as the Palms, Tree Ferns, &c., increase very little in thickness as they advance in age; but their wood becomes gradually more solid, by the woody fibres formed every year in the interior of their stems. Trees of this kind have no medullary rays, and their trunks, when cut down, show none of those marks of the successive layers of wood which are so conspicuous in exogenous trees.

Enkia'nthus.—*Ericàceæ.*—Greenhouse shrubs, with very handsome arbutus-like pink and white flowers, which are produced from September to February. The plants are very difficult to manage. They should be grown in very sandy loam, mixed with a little peat: and they should be allowed plenty of air and light, with only enough of heat to exclude the frost. They will not, however, bear planting out, as their roots appear to require to be confined in a small space, and the plants rarely do well if they are transplanted, unless before the roots have pushed through the ball of earth in the pot, as the roots seem to dislike fresh soil. The pots should be well drained with crocks, and care should be taken neither to over-water the plants, nor to let them become very dry. They are propagated by cuttings of the ripe wood, which are struck in sand, under a bell-glass, but without bottom-heat; and which, when transplanted, should have balls of earth attached. For this reason, only two or three cuttings should be put into each pot, and these should be as far asunder as possible.

E'pacris.—*Epacrídeæ.*—The Epacris is a New Holland shrub, which the first settlers mistook for a kind of Heath, and which is still called the Heath in Australia, where the true Heath (*Erìca*) is unknown. The E'pacris should be grown in a soil composed of turf bog, chopped small, but not crumbled, and mixed with sand; and they do best in double pots, with moss, kept moist, stuffed between; as, if the hot sun comes on the outside of the pot, the tender roots, which soon become matted round the ball of earth in the pot, will be withered, and the plants will receive a severe check, if they are not killed. The pots should be well drained, by filling them about a third full of broken pots, or pieces of brickbat, the largest of which should not exceed two inches in diameter, and small lumps of freestone; and this will provide a reservoir of moisture for the nourishment of the roots. The plants should be potted high, like Heaths, as the collar is inevitably rotted, if buried, by the moisture which is essential for the roots. They require plenty of air and light, but not much heat; sufficient to exclude the frost in winter is quite enough for them. Cuttings of the young wood may be struck in pure sand, under a bell-glass, and with the aid of bottom-heat. See Eri'ca and Cuttings.

E'PHEDRA. — *Gnetàceæ.* — The shrubby Horse-tail, or Sea Grape. Very curious small evergreen shrubs, with jointed branches, and apparently without leaves. They grow best in sea-sand; and, when pegged down and kept clipped closely, may be made to present the extraordinary appearance of green turf stretching to the very brink of the sea, and even covered by it at full tide. They are used for this purpose, Du Hamel tells us, in Africa, to cover those dry burning sands, and to give the appearance of an English lawn, where not a single blade of grass will grow. The berries are wholesome, and, when ripe, taste like mulberries.

EPIDE'NDRUM. — *Orchidàceæ.* — Parasitic plants, which should be grown in a damp stove or orchideous house, on pieces of wood hung up from the rafters for that purpose. The roots must be wrapped in damp moss and tied on the wood, into which they will soon penetrate. These plants may also be grown in baskets, or cocoa-nuts filled with moss, and hung up in the same manner. They require to be grown in the shade, and kept very moist and very hot.

EPIGÆ'A. — *Ericàceæ.* — The Ground Laurel. A little creeping plant, with white flowers, suitable for rockwork. It should be grown in sandy peat, and never suffered to become too dry. There is a pink-flowered variety, which was raised by Mr. Milne, nurseryman, Stoke Newington.

EPILO'BIUM.— *Onagràceæ.* — The French Willow-herb. A tall showy perennial, with stoloniferous roots, only suited to a shrubbery. It requires no care in its culture; the only difficulty being to prevent its overpowering everything else, when it is once planted in any situation not exceedingly dry. There are several *wild species of* Epilobium common in Britain, one of which is called by the odd name of Codlings-and-Cream. ***E. alpinus*** is a pretty little plant for rockwork.

EPIPHY'LLUM.— ***Cactàceæ.*** — One of the genera formed out of the Linnean genus ***Cáctus***, by Mr. Haworth, and comprising those Cacti that produce their flowers on their leaves. The genus ***Epiphyllum*** is, however, now given up, and the plants in it are called Cereus by botanists. ***E. truncàtum*** and ***E. speciòsum***, two of the best-known species of this division of Cacti, are, however, still generally called by their original names of ***Cáctus truncatus***, and ***Cáctus speciosus***. Both species are abundant-flowerers, and require only greenhouse heat. ***C. truncatus*** will grow grafted on almost any other species, and it will bear other species grafted on it. For culture, see CEREUS.

ERA'NTHUS. — ***Ranunculaceæ.*** — The Winter Aconite is a low-growing perennial, which is one of the first flowers to blossom in spring. It is quite hardy, and will grow in any common soil; and it may be easily increased by offsets from the roots.

ERI'CA.—*Ericàceæ.*—The different species of Heaths are among the most beautiful of our greenhouse plants, and are much more easily grown than is generally supposed. The principal cause of so many failures is, first, that Heaths are generally potted much too low, and thus the collar of the plant is frequently rotted; secondly, that sufficient attention is not paid to watering, as sometimes they are allowed to be sodden with moisture, from the pots being improperly drained, and at others kept much too dry, by irregular or imperfect watering; and, thirdly, that they are often grown on a stone shelf in a greenhouse, or on a balcony during the summer, when a powerful sun striking on the pot is sure to scorch their delicate fibrous roots, or, in the winter, shut up among other plants, and scarcely allowed any air at all; in either of which cases they are sure to perish. These being the principal reasons why Heaths do not generally succeed, it is now necessary to describe what is considered the best method of cultivating them. The soil most suitable to Heaths is a mixture of three parts of well-sifted peat to one of white or silver sand, thoroughly mixed; and, if the plants are very large, a small portion of loam may sometimes be added, though this is not often required. In potting Heaths, great attention must be paid to the drainage; and, in order to render it as perfect as possible, two or three moderate-sized potsherds should be put over the hole in the bottom of the pot; after which it should be filled about a quarter full with very small pieces of broken tiles; and over this there should be a thin layer of unsifted peat. Above the unsifted peat should be a layer of prepared peat and sand, and on this the roots of the Heath should be placed, and more of the mixture of peat and sand shaken in among them; the plants being so placed, that the collar may be above the level of the mould in the pot, when sufficiently full. The compost should be pressed tightly into the pot; but a little space should be left between it and the rim, to hold water; and as soon as the potting is finished, the plant should be set aside in the shade, or in a cold frame.

Heaths, to be well-grown, should always be kept in a frame, or house, by themselves; as they are of too delicate a nature to bear the respiration from other plants, and they also require a very different treatment. During summer, when in a frame, they should be allowed all the air that can possibly be given to them, and they should be frequently watered overhead, as the gardeners call it, when the sun is not upon them; as the winter comes on, less air should be given, and they should then never be watered over their tops; but still in fine weather a little air may be allowed to them, even during a slight frost. It may indeed be taken as a proverb, that Heaths like to feel the wind between every leaf. When grown in greenhouses, Heaths need not be watered overhead; but great care must be taken that the roots never get dried up, for if they do they seldom recover: indeed, these plants ought never to be put in greenhouses or rooms, except during the season of flowering. In very frosty weather, the only protection necessary for Heaths is a double mat thrown over the glass of the frame, and suffered to remain there till the frost is gone away; for should the frost affect the plants, and they should be afterwards exposed to the sun and air, they become what is called scorched, and they will either die, or lose the greater part of their leaves.

Heaths are raised from seed-cuttings or layers, but most frequently from cuttings, full details for making which have been already given. (See Cuttings.) Heath-seed should be sown, if foreign, as soon as it arrives; and, if native, as soon as it is ripe. For sowing the seed, shallow pots or pans should be prepared, in the same manner as was described for potting, but with rather more sand; and the seed should be mixed with a little sand, and scattered over the surface of the mould; after which it may be watered, and set on a greenhouse shelf, where it may remain till the young plants are about an inch high, when they should be carefully taken up, and set round the edges of pots, about three in a thumb-pot, and then replaced on the shelf, till they have grown sufficiently large to be potted off singly into small pots; when they should be allowed to remain a few days in the house till they are well-rooted; after which they may be placed in the frame with the large plants. Heaths in pots should never have saucers to stand in, and they should be watered twice a day in summer, and once in winter.

Eri'nus. -*Scrophularineæ*.--Only two species are known, one of which is a beautiful little plant with purple flowers, which grows naturally on old walls, and is admirably adapted for rockwork, as it continues flowering profusely all the summer. It is increased by seeds, or by dividing the roots; and it requires scarcely any soil to grow in, but the most suitable is peat, and pounded bricks or lime-rubbish.

Eriobo'trya. — *Rosàceæ*. — *E. jàpónica*, formerly called *Méspilus japónica*, the Loquat-tree of the East Indies, is a very handsome tree for planting in a conservatory for its noble leaves. It bears clusters of white flowers, and yellow fruit. In warm situations it will stand in the open air, but it requires protection from severe frosts. It should be grown in a rich loamy soil, and is generally propagated by grafting on the common Hawthorn.

Ero'dium. —*Geraniàceæ*. — The Wild Geranium. The genus Erodium differs from Geranium and Pelargonium in the shape of its seed-vessel. In all the three, the seed-pod resembles the head and beak of a bird; in Geranium it resembles a crane's bill, in Pelargonium it is a stork's bill, and in Erodium a heron's bill. Besides these, the late Mr. Sweet divided the *Geraniàceæ* into a great many genera, which are now seldom to be met with. The Erodiums are dwarf annuals, and perennials, with pretty flowers, only suitable for rockwork. The tender kinds are grown in a mixture of sandy loam and peat, and the hardy ones in any common garden-soil; and they are increased by seeds, division of the roots, and cuttings.

Ery'simum.—*Cruciferæ*.—Hedge Mustard. Most of the kinds are weedy plants, generally biennials, seldom grown in British gardens. One species, *E. Perofskianum*, an annual, with dark-orange flowers, introduced in 1838, has become popular from its beauty. *E. Ibéricum*, Dec., (*Cheiránthus armeniàcus*, Botanical Magazine,) a perennial introduced in 1803, somewhat resembles *E. Perofskianum* in appearance, except that its flowers are yellow instead of orange. These plants grow best in sandy peat mixed with a little loam; and they are quite hardy.

Erythræ'a. — *Gentianàceæ*. — The Lesser Centaury. Little pink-flowered plants, mostly annuals, suitable for rockwork. The seeds should be sown in autumn in the open border, and the plants removed in patches, with earth attached, to the rockwork in spring.

Erythri'na. — *Leguminoseæ*. — The Coral Tree. Stove and greenhouse shrubs, with splendid coral-coloured flowers. *E. laurifòlia*, and *E. Crista-gálli*, will grow in the open air, and they will flower magnificently in a warm sunny border, if sheltered by a south wall. The soil should be a sandy loam, or loam and peat; and they are propagated by cuttings of the young wood struck in sand under a glass, but without bottom-heat.

Erythro'nium. — *Tulipaceæ*. — See Dog's-tooth Violet.

Escallo'nia.—*Escalloniaceæ*. — Beautiful shrubs, natives of South America, which are nearly hardy in the climate of London. They grow best in peaty soil, or in very sandy loam. *E. rùbra* is generally trained against a wall, but *E. Monte Vidénsis*, which produces large clusters of white flowers, is grown as a bush. Both kinds require protection from severe frosts. There are several other kinds, but only the two mentioned are in general cultivation in British gardens.

Eschscho'ltzia. — *Papaveràceæ.* —Annual plants, with showy flowers, natives of California, on which account the first species introduced was called the Californian Poppy. The seeds should be sown in the open border as soon as they are ripe, as if the sowing be delayed till spring, the plants frequently do not flower till the second year. Sometimes they will live, and flower two, or even three years in succession, though this is very rarely the case.

Etiolated.--Drawn up, with weak and slender stems—a consequence which in hardy plants results from want of thinning out in proper time, and in greenhouse-plants from being kept in too small pots, and too far from the light.

Eucaly'ptus.—*Myrtàceæ.*—Australian trees of enormous size, some species of which are grown in England as greenhouse shrubs. They should be grown in loam and peat, and are propagated by cuttings, which are very difficult to strike.

Euchari'dium.—*Onagràriæ.*— A little annual, a native of California, nearly allied to the Clarkias. It was introduced in 1836, but as it does not seed freely it is as yet rare. It should be grown in loam and peat.

Euge'nia. — *Myrtàceæ.* — The Rose Apple. Handsome shrubs, grown as fruit-trees in the East Indies, which produce their splendid flowers freely in British stoves. They should be grown in a mixture of two-thirds sandy loam and one-third peat, and are propagated by cuttings of the ripe wood, which strike freely.

Euo'nymus.—*Celastrineæ.*—The Spindle-tree. The common British species is well known for its curious and very ornamental fruit; but the American kind, *E. latifòlius*, is much handsomer both in fruit and foliage. It is a very valuable shrub for a small garden, as it will continue to thrive, and to produce abundance of flowers and fruit every year, for many years in succession, without increasing much in size, or requiring to be cut in. It is also ornamental in early spring, from the peculiar form of its buds and the richness of its dark red bracteas. All the kinds will grow in any common garden soil, and they are increased by seeds or cuttings.

Eupho'rbia. — *Euphorbiàceæ.* — Some of the kinds are British weeds, such as the Spurge Caper; but other kinds are thorny shrubs, requiring the heat of a stove in Britain, and producing flowers of a most brilliant scarlet. The most beautiful kind is *E. fúlgens*, Karwinsky, *E. Jacquiniæflòra*, Hook., which was introduced in 1836 by Mr. Rauch. The best plants are raised from seed; but cuttings may be struck by plunging them into the bark-bed, and not covering them with a glass. The flowering plants should be grown in loam, mixed with lime rubbish, or pounded brick.

Euta'xia. — *Leguminòsæ.* — Australian shrubs, with yellow and orange pea-flowers, which in England require a green-house. They should be grown in light peaty soil, and receive the general treatment of Australian shrubs. There are only two species.

Eu'toca. — *Boragìneæ.* — Hardy and somewhat coarse-growing annuals and perennials, which require the usual treatment of similar plants. (See Annuals and Perennials.)

They will grow in any common garden soil, and the annuals should be sown in March or April, as, though they are natives of California, they are not injured by heat.

Evening Primrose. See Œno-the'ra.

Evergreens.—No garden should be without its due proportion of evergreens; and these plants are still more essential in small gardens than in large ones. Their advantages are, that they afford a screen to secure privacy in winter as well as summer; that they preserve an appearance of verdure at all seasons; and that they do not disfigure the walks by falling leaves, which, where there is no regular gardener, render it very difficult to keep a place neat. They are also very useful in affording a rich background to those ornamental trees and shrubs which produce their flowers before their leaves; such as the double-blossomed Peach, the Almond, the Snowy Mespilus, and Magnolia Conspicua. It is the want of evergreens that gives the gardens in the neighbourhood of Paris, and most of the other continental cities, such an air of meagreness and poverty. But it cannot there be remedied, as few evergreens will resist the cold of their winters. This may appear strange to those who have experienced the heat of the continental summers; but the fact is, that their winters are as much colder than ours as their summers are warmer, and thus the average heat of the year is nearly the same. Alternate seasons of great heat and cold are favourable to deciduous plants, as the heat ripens their wood, and the cold gives them a season of complete repose when they have lost their leaves; but a moist temperate climate like that of Britain is more suitable to evergreens, which continue in a growing state nearly all the year.

In street gardens, besides the evergreen trees and shrubs, it is advisable to select a few evergreen herbaceous plants, such as Pinks and Carnations, Wallflowers, &c., to give an agreeable effect to the beds during winter, when they are devoid of flowers.

Evergreen Thorn.—The Pyracantha. (See Cratæ'gus).

Everlasting.—See Gnapha'lium and Helichry'sum.

Everlasting Pea.—See La'thyrus.

Exogens.—Dicotyledonous plants. The exogenous plants have received their name because the new wood of their trees and shrubs is deposited on the outside of the old wood, one layer being deposited every year. Thus the age of a tree may be counted by the number of its layers, shown by its wood when the trunk is cut down. The soil in which the tree was grown, and even the weather in the different years, may be guessed in the same manner; as the layers of trees grown in rich valleys are much thicker than those of trees grown in poor soils on mountains; and the layers deposited in damp cold summers are thicker than those of dry, warm seasons. When trees have grown in a wood, with one side of the trunk fully exposed to the sun, and the other shaded by the other trees, a difference is very perceptible in the layers. Exogenous trees have medullary rays and reticulated leaves. All the forest trees of Britain and other temperate climates belong to this class.

F.

Fan Palm. — See Dwarf Fan Palm.

Feather Grass.—*Stìpa pennàta.* —A beautiful kind of grass, well worth growing to form tufts in flower borders, from its feathery lightness and graceful habit of growth. It should be grown in light rich soil; and it is propagated by seeds, or dividing the roots.

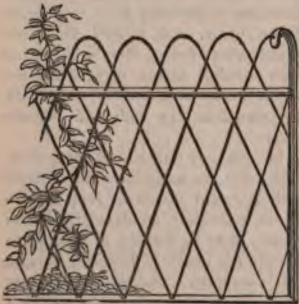
Fe'dia. — *Valeriàneæ.* — Horns. — *F. cornucòpiæ*, formerly considered to belong to the genus *Valeriàna*, is a coarse-growing, weedy-looking plant, with pink flowers, and curious seed-pods, shaped like the figures we see of the Cornucopia, or Horn of Plenty. It is an annual, and the seeds only require sowing in the open border.

Fences for flower-gardens and shrubberies, are either such as are intended to be invisible, or, more properly, not acknowledged,—such as barriers of wire, or light iron rods, and sunk fences; or such as are intended to be acknowledged, and to form part of the landscape,—such as architectural parapets and hedges. Wire fences are commonly formed of light iron posts or stakes, through holes in which are stretched stout wires, or slender iron rods; or they are formed of light iron hurdles,—that is, separate iron-frames, which are placed end to end, and can be removed at pleasure. In forming wire fences of stakes and iron wires, there is no difficulty when the line of direction is perfectly straight, or consists of a number of straight lines joined together; but when the direction is curvilinear, some attention is requisite to fix the posts in such a manner as to permit the wires, which pass through holes in them, to be drawn quite tight. To admit of this being done, each post must be fixed into a piece of wood or stone, and supported by a brace on the concave side of the curve; and both the block and the brace must be buried so far under the soil as not to be seen. Fences of this description are put up in a very superior manner by Mr. Porter, of Thames-street, London. Iron, or wire hurdles, are too well known to require description. When either hurdles or fences, composed of posts and rods of wire, are intended to keep out hares and rabbits, the lower parts of them, to about the height of two feet, require finer wires to be fixed to them, in an upright direction, at about three inches apart.

Architectural fences are used in small gardens, close to the house; and they should generally be low walls, of open work, in the style of the architecture of the building; and these walls may have piers at regular distances, terminating in vases, or other architectural ornaments, provided these are in harmony with the house. These walls, and indeed all other architectural fences, should be varied with shrubby plants planted against them, so as to harmonise them with the plants in the beds and borders within.

Hedges may either be of evergreens, neatly cut, so as to form living walls with standard plants at regular distances, to imitate architectural piers; or they may be formed of a mixture of different kinds of flowering shrubs, with evergreen standard low trees at regular distances. No plant makes a finer flower-garden hedge than the box, the standards in which may be formed of Cypresses, Junipers, or Arbor Vitæ. On a larger scale, the Holly makes an excellent hedge, and the standards may be of the variegated kinds of Holly. For a mixed hedge of evergreens and deciduous flowering shrubs, the Laurustinus, the Sweet Briar, the Pyracantha, and the Cydònia Japónica, with similar shrubs, may be used, with the lower kinds of American thorns (*Cratæ'gus*), or the flowering Crab (*Pỳrus spectábilis*), as standards. A very excellent flower-garden hedge may be formed by training the common or the Giant Ivy over a slight wire fence or trellis (*fig.* 10); and its uniformity may be broken, if it is very long, by standards, at regular distances, either of Ivy, trained on iron posts with umbrella tops, or of any kind of low deciduous evergreen trees. The variegated species of Ivy, the Ampelopsis, and a number of other climbing shrubs, ligneous or herbaceous, also make beautiful hedges for shelter or separation in flower-gardens. The Arbor Vitæ and common Laurel, alternating with the variegated variety, the narrow-leaved variety, and the Portugal Laurel, also make excellent flower-garden fences; as do the evergreen and variegated kinds of Privet, the variegated Holly, and the Aucuba. In short, there is scarcely any ornamental shrub that will not form a very suitable fence for a flower-garden, when carefully trained; and wire fences, in the summer season, may be covered with creeping or climbing annuals; such as the Nasturtium, the Convolvulus, &c., or even the tall-growing Salvias, Petunias, Sweetpeas, and Pelargoniums. A very pretty fence of this kind may be formed by training the common Mignonette over a wire trellis; as it is well known that the Mignonette, if sown in autumn and kept during the winter in a greenhouse, may be trained the following season to the height of three or four feet. Honeysuckles also make delightful fences.

FIG. 10.



FENCE.

Fennel Flower.—See **Nige'lla.**

Ferns are very ornamental in shrubberies, from their large and handsome leaves, and the curious manner in which these unrol when the plants first appear in spring. Some of the exotic ferns, also, are very handsome, and hothouses have, in many cases, been set entirely apart for them. One of the most interesting of these is at the seat of W. Borrer, Esq., at Henfield, Sussex; the interior of which is formed into caves of freestone in the crevices between which the ferns grow. Ferns disposed in this manner would form a very elegant ornament for a grotto. Exotic ferns are also the best plants for growing in the air-tight glass plant-cases, now becoming so fashionable in large drawing-rooms. (See **Plant Cases.**)

Ferra'ria.—*Irideæ.*—Cape tuberous rooted plants, with very curious flowers, and requiring the usual culture of similar plants. (See **Cape Bulbs.**)

Feverfew.—See **Pyre'thrum.**

Fica'ria.—*Ranunculàceæ.*—The lesser Celandine, or Pilewort. A British perennial, with bright yellow flowers, differing from those of the common Crowfoot in their petals being pointed. It likes a moist shady situation, and will thrive under the drip of trees.

Fi'cus ela'stica.—The Indian Rubber tree. A kind of Fig-tree, which yields the East Indian Caoutchouc; that used principally in making the water-proof clothing is, however, from Brazil, and is produced by *Siphònia Cachùchu*, one of the Euphorbiaceæ. In both cases the trunk of the tree is wounded, and there flows from the wound a thick milky juice, which, when hardened by exposure to the air, becomes the Indian rubber. *F. elástica* is a favourite stove-shrub in England, from its large size, and shining leathery leaves; but it very seldom produces either flowers or fruit; and, when it does, they have no beauty. The plants should be grown in sandy loam, and they strike readily from cuttings.

Fig Marigold.—See Mesembrya'nthemum.

Figwort.—*Scrophulària vernàlis*.—A British plant with yellow flowers, growing in moist places.

Fi'lices.—One of the natural orders, which includes all the different genera of ferns.

Fitness in a garden, as in everything else, is of the greatest importance in producing a good effect. By this term is meant the adaptation of plants to the situations fitting for them: for example, tall straggling growing plants, which have a very fine effect in a shrubbery, when backed by evergreen shrubs taller than themselves, would entirely destroy the beauty of a small garden, laid out in regular beds. In the like manner, small plants, however beautiful they may be, are lost among others more robust growing. To avoid these incongruities, the best plan is first to ascertain, if possible, the habit of growth and general appearance of every plant before introducing it into a flower-garden; and then carefully to consider the situation in which it is likely to look best. A little care and attention in this respect, with common plants, will have more effect in producing a beautiful flower-garden, than large sums laid out in the purchase of showy plants without it.

Flax.—See Li'num.

Florists' Flowers are those which it has been found may be grown to an extraordinary size and degree of perfection by taking great pains with their culture. The Dutch were the first who practised this art with their Hyacinths and Tulips; but their example has been followed by the florists of other countries, who, as they cultivate their flowers in the hope of winning prizes with them at flower shows, may be said to use them as instruments for gambling. All the varieties of florists' flowers are named, and every year many new kinds are raised, which are eagerly sought for, and sell for enormous prices. It is thus desirable that all florists' flowers should either hybridize freely, or vary very much from seed. The principal florists' flowers are the Hyacinth, the Tulip, the Dahlia, the Auricula, the Polyanthus, the Carnation, and the Pink; but to these may be added the Ranunculus and the Anemone, and, of late years, the Geraniums or Pelargoniums, the Heartseases, the Calceolarias, and the Chrysanthemums. Of all the kinds, the Dahlia is undoubtedly that respecting which there is most gambling and most rivalry. It may be observed, that the rules by which florists decide as to the merits of their respective flowers do not depend on any particular beauty of colour, and sometimes not even on form; but on certain arbitrary criteria which they have settled among themselves; as, for example, no Auricula or Polyanthus is admired that is what is called pin-eyed, that is, if the style projects beyond the stamens; and a perfect Dahlia should not show any green in the centre. Thus, as it requires to be a florist to know the full merit of florists' flowers, they are of comparatively little interest to amateurs.

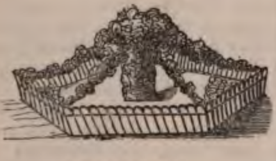
Flos Ado'nis.—See Ado'nis.

Flower de Luce.—See I'ris.

Flower Fence.—See Cæsalpi'nia.

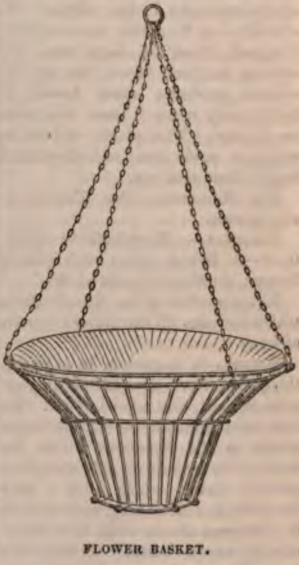
Flower Baskets.—These may be constructed in many different ways; some being intended to appear as if set on the ground, and others to be raised on pedestals. The former are generally constructed with curved pieces of iron, furnished with sharp spikes for entering the ground, like the prongs of a fork; and these are placed so as to form a circle, with wires for climbing plants extended across it, like the handles of a basket. (See *fig*. 11.) The plants must be trained up a wire frame in the centre, and thence brought down the wires to the curved pieces of iron forming the border of the basket. The basket may be filled up with flowers or not, at pleasure. Other receptacles for flowers may be wicker baskets, with the interstices stuffed with moss; or the jars in which grapes have been sent over; but when these last are used, or any other kind of vessel which is very deep in proportion to its breadth, the lower part should be filled with brickbats, pieces of freestone, and other similar materials, to within about a foot or six inches of the top. In all cases where flowers are grown in baskets and boxes, they should stand on a lawn; and the most luxuriant growing kinds should be chosen, to hang down the sides of the vessel. Captain Mangles, whose taste in ornamental gardening is well known, adopts the baskets *fig*. 12 and 13 for suspending from the roof of his greenhouse. The baskets are made of wire, with pots of earthenware or china inside. These baskets are alike suitable for the creeping Cereus, Moneywort, and other common plants which produce their flowers on hang-

FIG. 11.



FLOWER BASKET.

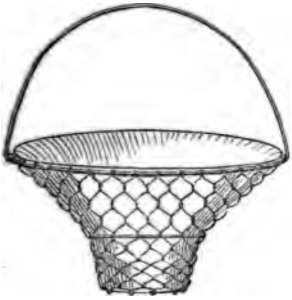
FIG. 12.



FLOWER BASKET.

ing stems, as for Epiphytes and orchideous plants. When the baskets are used for Epiphytes, the wire should generally be filled with moss, instead of having a pot placed in it.

FIG. 13.



FLOWER BASKET.

Flower-Gardens embrace a subject on which a volume might be written without exhausting it; but the present article will be confined to a few general observations, applicable in every case; and to a short notice of the different kinds of flower-gardens which have been, and are, in most general use.

All flower-gardens, to have a good effect, ought to be symmetrical; that is, they ought to have a centre, which shall appear decided and obvious at first sight, and sides; and all the figures or compartments into which the garden is laid out, ought to be in some way or other so connected with the centre as not to be separable from it, without injuring the general effect of the garden. All the beds and borders ought to have one general character of form and outline; that is, either curved, straight, or composite lines ought to prevail. The size of the beds ought also never to differ to such an extent, as to give the idea of large beds and small ones being mixed together; and the surface of the garden ought to be of the same character throughout; that is, it ought not to be curvilinear on one side of the centre, and flat or angular on the other. In the planting flower-gardens the same attention to unity ought to be kept in view. One side ought not to be planted with tall-growing plants, and the other with plants of low growth; nor one part with evergreens, whether ligneous or herbaceous, and the other part with annuals or bulbs. Flower-gardens which are intended to be ornamental all the year, ought to have a large proportion of evergreen herbaceous plants distributed regularly all over them; such as Pinks, Sweet Williams, Thrift, Saxifrages, and intermixed with very low evergreen shrubs, such as Heaths, Whortleberries, Thyme, Gaulthèria procùmbens, and a variety of similar plants. Flower-gardens which are intended to be chiefly ornamental in spring, ought to be rich in bulbs and early flowering shrubs; such as the Mezereon, Cydonia, or Pȳrus Japónica, Rhododendron dauricum atrovirens, Erica herbacea, &c.; those that are intended to be chiefly ornamental in summer, should be rich in annuals; and those that are to be in perfection in autumn, in Dahlias. Flower-gardens on a large scale never look so well as when the spaces between the beds are of turf; but those on a small scale may have the spaces between the beds of gravel, and the beds edged with box. It may be thought by some, that a flowering plant would look better than box for the edgings to the beds; but no effect is ever produced without contrast: and as the box is always green, and never flowers, it forms a striking contrast to beds of flowers in which the leaves are nearly hidden by the blossoms. Gravel walks with stone edgings do not form a good contrast, as the colours of the gravel and the stone are too near that of the dry soil of the beds.

All the different kinds of flower-gardens may be reduced to the following :—

The French garden, or parterre, is formed of arabesques, or scroll-work, or, as the French call it, of embroidery of box, with plain spaces of turf and gravel, the turf prevailing. The box is kept low, and there are but very few parts of the arabesque figures in which flowers or shrubs can be introduced. Those plants that are used, are kept in regular shape by cutting or clipping, and little regard is had to flowers ; the beauty of these gardens consisting in the figures of the arabesques being kept clear and distinct, and in the pleasing effect produced on the eye by masses of turf, in a country where verdure is rare in the summer season. These embroidered or arabesque gardens originated in Italy and France, and they are better adapted for warm climates than for England : they are, indeed, chiefly calculated for being seen from the windows of the house, and not for being walked in, like English flower-gardens.

The ancient English flower-garden is formed of beds, connected together so as to form a regular or symmetrical figure ; the beds being edged with box, or sometimes with flowering plants, and planted with herbaceous flowers, roses, and one or two other kinds of low flowering shrubs. The flowers in the beds are generally mixed in such a manner, that some may show blossom every month during summer, and that some may retain their leaves during winter. This kind of garden should be surrounded by a border of evergreen and deciduous shrubs, backed by low trees ; and in the centre there should be a sun-dial, a vase, a statue, or a basin and fountain.

The modern English flower-garden has the groundwork of turf, on which a system of beds are formed, in such a manner as to constitute a symmetrical figure ; or, if on a very large scale, groups of figures. The French flower-garden and the ancient English garden were chiefly calculated for being seen from an elevated situation, so as to show the whole at once ; but the modern English flower-garden is calculated to be walked through, and seen by degrees. The beds are generally of roundish or curvilinear figures, and they should never be of figures with numerous narrow angles, or projecting points ; because such parts can never be properly covered with plants, and therefore have always a bad effect. These beds are sometimes planted with a mixture of flowers alone, and sometimes with flowers and shrubs ; but they are more generally planted, each bed with one kind of flower, or one kind of shrub, so as to produce masses of colour, or of shades of colour, which will harmonise with the masses in the other beds. The spaces between the beds should not be less than two feet, for the convenience of walking and mowing ; and the surface of the beds should never be much higher than that of the turf, because, if they are, they will appear like blotches on a lawn. Besides, the plants in the highest part of the bed (which should be in the centre) will be drier than those on the sides,—they will grow with less vigour in dry seasons, and with too much vigour in moist seasons, if they are too much elevated ; so that the plants in the garden will never produce a uniform surface throughout. Some beds in flower-gardens of this description are entirely filled with roses, which are often pegged down and kept low; and other beds are filled with low evergreen shrubs, or with deciduous shrubs which have conspicuous flowers, such as Rhododendrons, Azaleas, &c. For every garden of this kind there is, or ought to be, a basin of water, as well for effect, as for watering the plants; and if the garden be on a large scale, there may be statues, vases, open and covered seats, rustic baskets containing plants, rockwork, and a variety of other objects; but these require to be introduced with great caution, and afford an excellent opportunity for a lady to exercise her taste in their arrangement. In fact, these ornaments, if not well managed, destroy the simplicity and elegance of the garden, and do more harm than good. When flower-gardens are close to the house, and are intended to be very highly kept, the beds are often surrounded with a low frame-work of wire or trellis-work, so as give them the effect of baskets of flowers; and this has sometimes a very good effect. Very often handles of wire-work are appended to these baskets, over which are trained beautiful climbing plants, such as the Maurandias and Lophospermums, which flower abundantly during the whole summer.

The architectural flower-garden, or Italian garden, always adjoins the house, and it is bordered and separated from the rest of the pleasure grounds by an architectural parapet or wall (see FENCES). It consists of beds symmetrically arranged, with gravel or pavement between; and the beds are bordered or edged with stone. In other respects, these gardens are treated like the old English flower-garden.

Terrace gardens are merely architectural gardens, formed on platforms adjoining the house, on one or more levels, each level being supported by a terrace-wall; but as they are chiefly adapted for mansions and places of considerable extent, where of course a regular gardener must be kept, it does not appear necessary to enlarge on them here.

FLOWERING FERN.—*Osmúnda regàlis.*—A native of Britain, and one of the largest and handsomest of the British ferns.

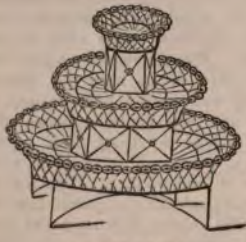
FLOWERING RASPBERRY.—*Rùbus odoràtus.*—See RU'BUS.

FLOWERING RUSH. — *Bútomus umbellàtus.* — A British aquatic plant, producing pink flowers. When cultivated, the seeds should be sown in loamy soil at the bottom of the aquarium or pond where it is to grow, or in a pot plunged to a considerable depth; or it may be increased by dividing the root.

FLOWER-POTS are commonly of a red porous kind of earthenware, which is much better for the plants than the more ornamental kinds sold in the china shops: which from being glazed, and consequently not porous, are apt to retain the moisture so as to be injurious to the roots of the plants. When china flower-pots are used, they should have the bottom pierced with several holes instead of one; and they should be particularly well drained, by being filled to, at least, a quarter of their depth with pieces of broken tiles. Glazed pots are most suitable for plants kept in balconies, where they are much exposed to the air, as they do not admit of transpiration from the sides, and consequently the earth contained in them does not so soon become dry. There are ten sizes of pots in common use in British gardens, varying from two inches in diameter to a foot and a half, which are distinguished as sixties, forty-eights, thirty-twos, &c., diminishing twelve every time, from sixties up to the largest size which are called twos; the same quantity of clay, called a cast, being used for the two large pots as for the sixty small ones. Besides these there are thumb pots, about an inch in diameter and two inches deep, of which there are eighty to a cast; square stone pots for raising seeds, or striking cuttings, and which are seldom used but by nurserymen; and deep narrow pots for bulbous rooted plants. Many other shapes have been invented to suit particular purposes, but the above are the only kinds in constant and regular use.

Flower-stands are generally constructed of wire, painted green; and they are so contrived as to hold a number of flower-pots. They are of various shapes; some being only large enough to hold two or three flower-pots, and others, as *fig.* 14, consisting of several tiers, and holding almost as many plants as a small green-house. They vary very much in form, and may be designed to suit the taste. Though elegant objects in a garden or under a veranda, they are not well adapted for keeping plants in a healthy state; as, from the pots in them being exposed to the sun and air on all sides, the roots are liable to become withered by the alterations in temperature. It is therefore generally advisable to keep all the plants in flower-stands in double pots, or to fill the interstices between the pots in the stand with moss. Generally speaking, the observations already given respecting plants in balconies apply to plants kept on flower-stands.

FIG. 14.



FLOWER-STAND.

Fluviales.—A natural order containing water plants.

Fly Honeysuckle.—The upright shrubby species of Honeysuckle, such as *Lonicera Xylósteum*, the common fly honeysuckle, and *L. Tatárica* the Tartarian honeysuckle.—See **Lonicera.**

Fly Ophrys.—See **Ophrys.**

Fontane'sia.—*Oleàceæ.*—A shrub or low tree, resembling in its general appearance the common privet, but with handsomer flowers, which are first whitish, but afterwards become of a brownish yellow. It is a native of Syria, where its leaves remain on all the year; but in the climates of London and Paris they drop off in the course of the winter. It will grow in any common garden soil, and it is propagated by layers, cuttings, and grafting on the privet.

Forficula.—See **Earwig.**

Forget-me-not.—*Myosòtis palústris.*—A British plant worth cultivating for its blue flowers, as well as for its name. It is a marsh plant, and should be grown near water. *M. sylvatica* has smaller flowers, and of a paler blue. The other plants belonging to the genus *Myosòtis* are known by the popular English names of Scorpion-grass and Mouse-ear.

Forking.—A mode of stirring the ground so as to admit air and moisture to the roots of plants, without disturbing or injuring them, which would be unavoidable if the ground were dug.

Formica.—See **Ants.**

Fothergi'lla.—*Hamamelideæ.*—American dwarf shrubs with large handsome leaves, and white fragrant flowers. The plants should be grown in a moist peaty soil, and are injured by very severe frosts. The flowers appear before the leaves.

Fountains are of two kinds: jets, which rise up in a single tube of water to a great height, and then fall in mist or vapour; and drooping fountains, which are forced up through a pipe, terminated by a kind of rose pierced with holes, called an adjutage, which makes the water assume some particular shape in descending. The principle on which fountains are constructed is, that if a large quantity of water be contained in a cistern, or other reservoir, in any elevated situation, and pipes be contrived from it to carry the water down to the ground, and along its surface, that the water will always attempt to rise to its own level the moment it can find a vent. When the orifice is large, this inclination is only shown in a kind of bubbling upwards, as the ascent of the water is prevented by the weight of the atmosphere above it: but, where the orifice is small, the column of water will force its way through the air very nearly to the height of the large body of water from which it descended. The height to which a jet of water will ascend, therefore, depends on the height which the cistern that is to supply it is above the ground from which it is to ascend; and on the size of the orifice through which it is to issue. Something must, however, be allowed for the resistance which even a slender column of water meets with from the air; and something is also lost by the friction of the water on the pipes it passes through, if the place from which the fountain is to play should be far from the supplying cistern. The time which the fountain will play depends on the quantity of water which the cistern contains; and the evenness and proportion of the ascending column of water on the diameter of the conducting pipe, which should be five times the diameter of the orifice. To explain this, we will suppose a cistern erected on a summer-house twenty feet high, and that a fountain is wished to play about a hundred yards from it, in a right line. Then if the diameter of the descending and conducting pipes be two inches and a half, and the diameter of the orifice for the jet be half an inch, the water will rise about eighteen feet high. It must be observed that the water will rise to a less height in proportion to the distance which the fountain is from the cistern, the loss by friction being about a foot for every hundred yards; and also that if the pipes take any bend or curvature, the loss by friction becomes greater. The time that the fountain will continue to play may be calculated by estimating the quantity of water the cistern will contain, as a jet of the size above described will discharge about sixty-five quarts a minute. The pipes should be of lead, a quarter of an inch thick; as if they are too slight they are very apt to burst and leak, from the great weight and pressure of the water; and they should be carried deep enough into the ground to be out of the reach of danger from frost. They should also be so contrived as to present a uniform slope towards the point from which the jet is to issue; to prevent an accumulation of air, or of sediment from the water in the pipes, either of which will prevent the fountain from playing.

Drooping fountains do not require the water to rise so high for them as for jets; and consequently the cistern need not be so much elevated. The beauty of fountains of this kind depends on the adjutages, which are so contrived as to throw the water in many different forms. For example, some are intended to represent a dome, and others a convolvulus, a basket, a wheatsheaf, and a variety of other devices. The water from these fountains is generally received into a shell, whence it forms a sort of miniature cascade to the basin below.

Four-o'clock-flower. — A kind of Marvel of Peru. See **Mira'bilis.**

Foxglove.—See **Digita'lis.**

Frames. — A frame in gardening may be described as a bottomless box with a cover of glass. The glass is fixed in a sash of convenient dimensions for being taken off, and put on again at pleasure, and the sides of the box are of such a height as to admit of the growth of plants of a foot or more high. The back of the frame or box is placed towards the north, and is generally about the height of two feet, and the frame being right-angled, the side towards the south is usually about one foot or fourteen inches in height. The ordinary width is from five feet to seven feet, and the length may be three or more times the width, divided into sashes of two and a half feet or three feet broad. The frame may be either set on a bed of the common soil of the garden, in which case it is merely used for the protection of plants from the weather, or it may be placed on a bed of fermenting manure, or other materials that generate heat, for bringing forward seeds or tender plants. Sometimes frames are placed against steeply sloping surfaces, or against walls ; in which cases the object is to bring forward plants trained on the wall or sloping surface. Frames are of the greatest use in gardening ; not only for protecting plants that are not quite so hardy as those usually planted in the open air, especially in the winter season, such as Alpines, and seedlings of hardy plants which are somewhat tender when young, but for germinating seeds. Frames on beds of dung are commonly called *hot-beds*, and are particularly useful for raising young plants from seeds, striking cuttings, and, in culinary gardening, for growing crops of such plants as Cucumbers, Melons, &c. As the air confined within the frame is apt to become suddenly heated by bright sunshine, or by the fermenting material when the open air is temperate, care must be taken to prevent the heat from being at any time greater than the plants will bear; and this is effected by raising the sashes, or lights as they are technically called, by wooden wedges placed between them and the frame, in the hinder or higher part of the frame, so as to admit of the escape of the excessively heated air. Hence it is desirable in all frames, where much delicacy of temperature requires to be attended to, to keep a thermometer within them; and in general, when the temperature within rises to 60°, to lift up the sash and to introduce the wedge between it and the back of the frame, so as to permit the heated air to escape. Frames are sometimes also set upon low brick walls, which may either be raised above the soil, if it should be naturally moist, or sunk into it, if it should be naturally dry. In such cases, instead of a box of boards, the box may be said to be formed of brick or stone, on the top of which is placed a framing of wood to receive the sashes. Such frames, or brick-pits, as they are called, are used to preserve half-hardy and greenhouse plants during the winter. All frames that are used in winter or spring should be covered during the night, especially when the weather is cold, to retain the heat generated by the sun, or the fermenting material, during the day. This covering is generally of bast mats laid on the glass sashes ; but it is rendered much more effective when the mats are kept an inch or two apart from the sashes, so as to retain between them a stratum of air, which, from its non-conducting power, greatly lessens the escape of heat through the mats. As mats are apt to absorb the rain instead of conducting it off, coverings of thatch formed of regularly drawn wheat-straw or reeds are considered preferable; though such roofings are scarcely worth attending to in a small garden, where there is perhaps only one frame. The best covering of all is composed of boarded shutters, placed a few inches distant from the frame, and this species of shelter is at once neat and durable, and calculated to retain a stratum of air above the glass, while it effectually throws off the rain.—See Hotbeds and Pits.

Franco'a.—*Francoaceæ*, or *Galacineæ*.—Handsome plants, most of which may be treated either as annuals or perennials, and may be always raised from seed. They are nearly hardy, and will grow in any common garden soil. *F. ramòsa*, with white flowers, is generally kept in the greenhouse, and will not admit of being treated as an annual.

Franke'nia.—*Caryophyllàceæ*.—Sea heath. Dwarf perennials, which should be grown in pots, or on rock-work, in a mixture of loam and peat, and which are increased by seeds, or cuttings.

Fraxine'lla.—See Dicta'mnus.

French Berries. The fruit of *Rhámnus tinctòrius*.—See Rha'mnus.

French Honeysuckle. — See Hedy'sarum.

French Marigold.—See Tage'tes.

Fringe-Tree. — See Chiona'nthus.

Fritill'aria. — *Tulipàceæ*. — Hardy bulbous rooted plants, which will thrive in any common garden soil; but which do best in sandy loam. There are several species. They are increased by offsets; and they may remain several years in the ground without taking up, and without receiving any injury.

Fritillary.—See Fritill'aria.

Frogbit.—*Hydrócharis morsus-ranæ*. — A very graceful aquatic, with white flowers.

Frost is injurious to plants in proportion to their natural tenderness, and to their succulency, whether induced by art, by culture, or the season, or the accidental or natural moisture of the soil. Hence, to protect plants from frost, the first step is the thorough drainage of the subsoil; and the next, the use of a soil composed of materials which will readily permit the escape of water, and which, of course, is always comparatively dry. On such a soil, if a frame covered with glass sashes be placed, and covered with mats, thatch, or boards during severe nights, all half-hardy plants will be completely protected. But there are a great many plants in beds, and borders, and against walls, which cannot be conveniently protected by these means; and the roots or lower parts of the stems of plants thus situated may be covered with leaves, straw, litter, rotten tan, or any other dry non-conducting material which will retain air, and consequently prevent the escape of heat, and yet throw off water. In general, all herbaceous plants may be entirely covered during winter with such kind of materials; and all ligneous plants will be saved from being killed, if the root-stock, neck, or collar, be so covered. The branches and upper part of the stem, if left naked, may indeed be destroyed; but if the collar and the ground for two or three feet around it be thus protected, the life of the plant will be preserved, and the next spring, if the plant be cut down to the ground, it will spring up again from the collar. In general, the easiest ligneous plants to protect are those which throw up suckers; and the most difficult, those which shoot with difficulty from the root or stool, such as the pine and fir tribe. The easiest plants to protect are those which are planted against walls; because the branches can be saved from the perpendicular cold by a projecting coping, and the roots by litter, leaves, rotten tan, &c. What are called Alpine plants, which in their native country are covered during winter with snow, are best protected by being kept in pots, and placed in what is called a cold frame; that is, a box covered with glass, placed on the common soil of the garden, and consequently without bottom heat, but covered in severe weather with mats, thatch, or boards. Planting herbaceous plants and low shrubs in raised masses of soil covered with stone, technically called rock-work, is also a good means of preserving plants which are not quite hardy; because the mass of soil containing the roots is thus always more or less dry. One of the greatest enjoyments in gardening consists in growing the plants of warmer climates than our own in the open air; this, in the climate of Britain, is not so much to be effected by communicating artificial heat in the winter season, as by protecting them from frost and moisture. If all gardening were reduced to the mere growth of plants which were quite hardy, the art would lose half its interest. The nice point in this, as in many other cases, consists in overcoming difficulties; and the pleasure will be great, in proportion as these difficulties appear at first sight to be insurmountable.

Fu'chsia. — *Onagràriæ.* — The Fuchsias being all natives of South America, have till lately been generally treated as green-house plants, but the greater number are now considered to be among the more ornamental of our hardy exotics. They grow freely in the open air, and enliven our flower-gardens during the whole of the summer with their beautiful crimson flowers; and though they die down to the ground in winter they spring up from the root the following May, and during summer flower profusely. They grow freely in a mixture of vegetable earth, or peat, sandy loam, and a little well-rotted dung, which must be kept moist, but by no means sodden. All the species strike freely from cuttings of the young wood, without bottom heat or bell-glass; but they will do better with these assistants; and if planted round the edges of pots, in a rather more sandy soil than the mother-plants have been grown in, and plunged into a slight hotbed, and shaded, they will be fit to pot off in about a month or six weeks. Seeds are frequently ripened, and many very beautiful varieties and hybrids have been raised in this country. One of the finest of these hybrids is ***F. Standíshii***, raised between ***F. globòsa*** and ***F. fúlgens***, and figured in the Botanical Register for 1840. Seeds vegetate freely if sown as soon as they are ripened in a rather sandy soil, on a little heat; and unlike most other perennial plants, they will, if grown strongly, flower the first year. ***F. Groomii*** is a splendid kind, and was raised by Mr. Groom, of Walworth, from seed of ***F. globosa***. The following kinds are the best for growing in the open air, ***F. globòsa***, ***F. cónica***, ***F. virgàta***, ***F. microphýlla*** with small flowers, and ***F. grácilis***; which last, though naturally a handsome shrub, about four feet high, may be trained to a single stem so as to form a small tree, in the following manner. The first point is to select a healthy young plant that has a strong leader, and taking it into a forcing house, to remove its lateral branches and leaves to about half its height. The plant must then be kept constantly growing for two years, till it has attained the required height; during which period it must be frequently shifted into larger and larger pots; the lateral shoots and leaves must be taken off as fast as they appear. When the plant has acquired the height of eight or ten feet, it may be suffered to have a little rest; that is, it may be taken out of the hot-house, and placed in a greenhouse, when it will lose its leaves, and cease growing; for it must be observed, that while kept constantly growing by heat and moisture in the hot-house, it will retain its leaves during winter, contrary to the usual habits of the genus. The following spring, when the plant begins to grow, the top should be pinched off, when it will, in the course of a few months, produce a beautiful head, covered with flowers; and in this state, if set in the centre of a bed of Fuchsias on a lawn, or in a flower-garden, it will have a very pleasing effect. *F. fúlgens* is a tuberous-rooted species, with herbaceous stems, which naturally die off after the plant has produced its seeds. When this is the case the root requires to be kept quite dry till the following spring, when it may be brought forward by putting it into a hot-house, or plunging it into a hotbed. Young cuttings of this species strike as freely as any of the other sorts; but they require care, as they are liable to damp off. In some cases, a single leaf has struck, the roots proceeding from the thickened part at the base of the petiole. *F. arboréscens* forms, in its native country, a handsome low tree; but in England it proves much more tender than the other species, and succeeds best in the stove, where it deserves a place on account of its fine foliage, and its terminal heads of lilac flowers. It grows very freely from cuttings, which often attain the height of five or six feet in one year. *F. díscolor* is a hardy species, a native of Port Famine, near the Straits of Magellan, but it is not very handsome, from the dingy colour of its flowers. *F. coccínea* is interesting from having been the first Fuchsia grown in England, and the only one known in this country for many years; it having been introduced in 1788; while the oldest of the others (*F. grácilis*) was not introduced till 1823. *F. coccínea* should be kept in the green-house. All the Fuchsias hybridize freely with each other, and vary very much from seed, which most of the kinds ripen every year. The fruit is a dark purple berry, which when ripe is eatable.

Fuma'ria.—*Fumariàceæ.*—Pretty little plants with curiously shaped flowers, which grow best on calcareous or sandy soils. The annual kinds should be sown with other annuals in March, April, or May; and the perennial species are increased by division of the root. Some of the kinds are now called Corydàlis.

Fumitory.—See Fuma'ria.

Fu'nkia.—*Hemerocallidàceæ.*—The Japan Day-lily. Bulbous-rooted plants that were formerly considered to belong to the genus Hemerocallis. They are natives of China and Japan, and are grown in the open air in England. *F. cærùlea* is quite hardy and will grow anywhere, but *F. álba* requires a warm dry border, as do the newly introduced species. They are all very ornamental, and some of them are fragrant.

Furze.—See U'lex.

G.

GA'GEA.—*Asphodeláceæ.*—Pretty little European bulbous plants, generally with small dingy yellow flowers. They should be grown in sandy soil, and will not require taking up in winter. The plants belonging to this genus were formerly considere to belong to Ornithógalum. *Gàgea lùtea* or *fasciculàris* is a British plant.

GAILLA'RDIA.—*Compósitæ.* Very showy herbaceous plants, natives of America, some of which are annuals and others perennials. They grow best in peat soil. *G. Drummóndi* or *pícta*, and *G. pulchélla*, or *bícolor* as it is called in the seed-shops, are annuals; and their seeds should be sown on a slight hotbed in February or March; or in the open ground in the same months, and covered with a hand-glass, or flower-pot turned over them, to preserve them if the weather should be frosty when they come up. It is necessary to sow the seeds of these plants in February or March, as they are a long time before they come into flower. The true *G. bícolor* is a perennial species, now called *G. lanceolàta*, which should be grown in a peat border, and kept moderately moist; it is propagated by seeds or division of the root.

GALA'NTHUS.—*Amaryllidàceæ.*—The Snowdrop. The common British snowdrop, *G. nivàlis*, is well known both in its single and its double state; but *G. plicánthus*, the Russian snowdrop, is not so common. They both require a light rich soil, and they will thrive under the drip of trees. They are increased by offsets.

GALA'XIA. — *Iridàceæ.* — Dwarf bulbous-rooted plants, natives of the Cape of Good Hope, and generally with large yellow flowers. They should be planted in very sandy soil, and either taken up, or kept dry by covering with a hand-glass during winter. When grown in pots, the soil should be heath-mould, or very sandy loam.

GALE'GA.—*Leguminòsæ.*—Goat's Rue. Weedy looking plants, with small purple or white flowers, about the size of the common vetch, and bluish green leaves. They grow freely in any common soil, but they require a great deal of room, from their tall and bushy stems.

GALINSO'GEA. — *Compósitæ.*— *G. trilobàta* is a well-known showy Mexican annual, with rich orange-yellow flowers, which will grow in any common soil, and may be sown in March, April, or May. Like so many other plants, Professor De Candolle has changed its name; and it is now called *Sogalgìna trilobàta.*

GA'LIUM.—*Rubiàceæ.*--Bedstraw. Perennial and annual plants, some of which are aquatics, generally with yellow or white flowers; natives of Europe, and several of them British weeds. They will grow in any common soil, but they prefer sand or peat.

GARDENS, in floriculture, may be described as separate scenes for the display of ornamental plants. The forms of these gardens or scenes are different; some being laid out in beds, the prevailing forms of which are curvilinear; and others in beds, of which the prevailing forms are rectangular, such as squares, parallelograms, octagons, polygons, &c. In some gardens, the beds have the forms of particular styles of architecture, such as of the Gothic, Grecian, Elizabethan, &c.; and these latter forms have given rise to what are called styles or manners in laying out gardens. Hence we have gardens in the Gothic style in which the forms of

Gothic architecture prevail, others in which the Grecian forms prevail, and so on. In all these styles the great art is to adopt such forms as are favourable to the cultivation and display of plants; and for this purpose roundish forms, or such as have obtuse angles, are preferable to long narrow forms, or such as have acute angles; because the former are more convenient for stirring the soil, and the surface is more readily covered with plants, without at the same time causing the plants to spread over the boundaries. Hence long narrow forms are generally covered to excess by the plants spreading over the outline on the walks or spaces between; and in acute-angled forms the angles are not sufficiently covered. See FLOWER-GARDENS.

GARDENER.—To keep a flower-garden in perfection, it is necessary to have a good gardener, unless the amateur understands how the various operations of gardening are to be performed sufficiently well to be able to direct an indifferent gardener, or a common labourer, how to execute them. The difference in wages between a common gardener, and a man who understands his profession, is commonly about 20*l.* or 30*l.* a year; as an ordinary gardener generally costs about 20*s.* or 25*s.* a week, without lodging, while for 30*s.* a week with lodging, a gardener may be obtained who understands the propagation and culture of all ordinary plants, and how to keep a garden in good order. Thus, those persons who wish to have a show-garden, will find it the best plan, if their grounds are large, to employ a good gardener, and to leave everything to his direction, (for a really good gardener will not bear to be interfered with), allowing him to employ labourers as he may think proper; but if the grounds be small, this plan will be found too expensive, and it is generally best to contract with a nurseryman to keep the garden constantly in order, and full of plants during the whole summer. This plan is frequently followed in the neighbourhood of London; and, as an example of the expense, I may mention that Mr. Hopgood, of the Bayswater nursery, contracts to supply Captain Mangles, whose house and garden in Cambridge Terrace are so much and so deservedly admired for their show of flowers, for 70*l.* or 80*l.* a-year, keeping the beds and boxes full of plants and flowers from March to November. This is by far the most economical plan; for, as before observed, a first-rate flower gardener cannot be obtained under 70*l.* or 80*l.* a year. The great enjoyment of gardening, however, in my opinion, is only to be obtained by the amateur who gardens himself, and who understands the principles or reasons upon which each operation is founded; and therefore, I should recommend all persons fond of gardening, and especially ladies, who have sufficient leisure, to manage their gardens themselves, with the assistance of a man to perform the more laborious operations. It sometimes happens that a man-servant in the family, who is not overburdened with indoor duties, will answer this purpose; but it is generally preferable to employ a man who has been brought up as a gardener.

GARDE'NIA. — *Rubiàceæ.* — The Cape Jasmine, greenhouse and stove shrubs, most of which are natives of the East or West Indies, with large and handsome flowers, which are generally white. *G. flórida*, the common Cape Jasmine, obtained its English name from its having been first brought to England, from the Cape of Good Hope, where it was found cultivated in a garden, it being a native of China. All the species should be grown in a compost of loam and peat; and they all require a moist heat. They are propagated by cuttings of the young wood, struck in sand, under a glass, and with bottom heat.

Gard'oquia. — *Labiàtæ.* — Half shrubby dwarf plants, mostly natives of South America and Mexico; one species of which, *G. Hookèrii*, commonly called the Scarlet Thyme, which is a native of South Carolina, is very handsome. It should be grown in sandy peat and loam, in well-drained pots; and the plants should be plentifully supplied with water while they are in a growing state. It is nearly hardy, only requiring protection from frost, and it will continue flowering for several months. By frequent re-potting, and careful management, this plant may be greatly increased both in size and beauty; and it looks very well trained over a wire frame.

Garide'lla. —*Ranunculàceæ.*— A very curious-looking hardy annual, which will grow in any common garden soil; but which is seldom now found except in botanic gardens.

Garland Flower. — See Hedy'chium.

Garlic Flower.—See Allium.

Ga'rrya.—*Garryàceæ.*—A hardy evergreen, introduced only a few years since, and which produced its very handsome long pendulous spikes of blossoms, or catkins, for the first time in England in October, 1834. These spikes are produced in bunches of eight or ten together; and they are frequently above a foot long. It is quite hardy, and should be grown in a loamy soil, where it will continue flowering all the winter, in defiance of the cold. It is a most striking object, not only from the great abundance of its long, slender, graceful catkins, but from its dark green, glossy, and leathery leaves. It is readily increased by layers, or cuttings, struck in sand under a glass.

Gastrolo'bium. — *Leguminòsæ.* —Australian greenhouse shrubs, with a profusion of small orange flowers. For their culture, see Australian Shrubs.

Gates are only necessary in flower-gardens, where they are inclosed by hedges, walls, or sunk or wire fences, and the gate ought always to bear some kind of relation to the fence. A wire or iron fence, may have a wire or iron gate, but it should be always of the simplest construction; a rustic fence, should have a rustic gate; and a wall or a hedge commonly a close gate, or a boarded gate with stone or brick piers. Where a flower-garden is surrounded by a sunk fence composed of a sunk wall, and a fosse or ditch, the gate may in some cases be of iron between stone piers, and in others of light twisted wire. In all cases of this kind, the general harmony of the scene must be taken as a guide; and care taken that the gate neither appear too conspicuous, nor too insignificant.

Gathering Flowers for bouquets or nosegays, should always be performed when the plants are dry; otherwise, when tied together in a nosegay, the compressed leaves are liable to rot. The sprigs or shoots containing the flowers, or in the case of monocotyledonous plants, such as the Narcissus, the Hyacinth, &c., the flower stems, should always be taken off so as not to injure the leaves which remain on the plant; and in branching plants, such as the rose and all dicotyledonous herbaceous plants, the sprigs should be cut off at the back of a bud, otherwise in a short time an unsightly naked portion of the stem will remain on, which will at last wither, and disfigure the living plant. The branches should always be cut off, and not broken; as it is extremely difficult to break off a branch without injuring the portion that remains on the tree.

GATHERING SEEDS is an interesting operation; because it carries the mind forward to another year, and another generation. It should not be performed till the seed-pods are full-grown, which is easily known by the tendency of some of them to burst. It should always be done when the pods are perfectly dry, and consequently, after the warmest part of the day rather than before it. The pods after being gathered should be laid in papers or in saucers, and exposed to the air in a dry place in the shade; and after being thoroughly dried they may either be tied up in papers without being opened, or the seeds taken out, the husks removed, and the clean seeds tied up and preserved in a dry place.

GAULTHE'RIA.—*Ericàceæ.*—Dwarf hardy shrubs, natives of North America, with flowers like the Arbutus, and berry-like fruit which is good to eat. Both the species should be grown in peat, or heath mould; they are quite hardy, and will thrive under the drip of trees. They are propagated by layers. *G. Shallon* prefers a shady situation, where its roots may always be kept moist; and it will grow well and produce abundance of flowers and fruit in the closest parts of London.

GAU'RA.—*Onagràceæ.*—Curious hardy annual and biennial flowers, natives of North America, nearly allied to Clarkia, and requiring only the usual culture of their respective kinds.—See ANNUALS and BIENNIALS.

GEISSORHI'ZA.—*Iridàceæ.*—Tile Root. Beautiful little bulbous plants, which were formerly considered to belong to Ixia. *G. Rocheàna,* the Plaid Ixia, is particularly beautiful; and the whole plant is not above six inches high. The bulbs are not larger than a pea. All the species are natives of the Cape, and require a little protection during winter, though more from heavy rains than frost, if the bulbs are left in the ground at that season. If, however, they have been planted on a dry sandy bank, they may be left without any covering. All the species, from their low stature and the brilliancy of their flowers, look exceedingly well in pots. In this case they should be grown in sand and peat, or very sandy loam, and the pots should be well drained with cinders.

GELSE'MIUM.—*Apocýneæ.*—A pretty climbing evergreen shrub, generally kept in the greenhouse or conservatory, and generally known as *Bignònia sempervìrens,* a native of South Carolina. It is grown in a compost of sand and peat, and it is propagated by cuttings struck under a glass.

GENI'STA.—*Leguminòsæ.*—There are above fifty distinct species of Genista, most of which will live in the open air in British gardens, but some of which are greenhouse shrubs. They are all very handsome, from the profusion of their bright yellow pea-flowers. The greenhouse kinds should be grown in peat and loam, and are propagated by cuttings under a glass, which should be taken off frequently and wiped, or they will damp off.

GENTIAN.—See GENTIANA.

GENTIA'NA.—*Gentianàceæ.*—Well-known plants, generally with pretty flowers, and tonic properties. *G. acaùlis* is frequently used as an edging plant, and it is remarkable for the brilliant colour of its flowers, which are large, and of a deep mazarine blue. All the Gentians require abundance of free air, and will not grow well in the smoky atmosphere of a town. They should be grown in a light rich soil, and do best in a mixture of loam and peat, enriched with a little vegetable mould. *G. acaùlis* does best in peat alone. The perennial kinds are increased by dividing the root, and the annual ones by seeds, which should be sown as soon as ripe, as, if left till spring, they will not come up till the second year.

Geometric Gardens.—This style of gardening is that in which the shape of the ground, of the beds, of the walks, and even of the shrubs, is regular, or symmetrical; such as may be formed on paper by a rule and compasses. The ground, if originally flat, is reduced to a general level surface, over which the beds, or borders, are distributed so as to form figures either simply regular,—such as squares and parallelograms, repeated one after another—or squares and parallelograms, and circles or ovals, or other curvilinear figures,—so arranged as to be symmetrical; that is to say, that one half of the figure formed by the whole shall correspond with the other half. When the surface is naturally irregular or on a slope, it is thrown into different levels, which are joined by steep slopes called terraces, generally covered with turf, and ascended and descended by stone steps. Each of the levels is laid out either regularly or symmetrically, in the same manner as if the whole were only one bed; but the figures are of course smaller. Small trees or evergreen shrubs are distributed among the figures, and especially on each side of the main walks; and these trees or shrubs ought, in strict accordance with the style, to be cut or clipped into regular shapes; such as cones, pyramids, balls, candelabras, statues of men or animals, arcades, columns, or other architectural figures. In modern practice, this is generally neglected; but its omission is a defect, for cut trees are as essential to the geometric style, as having the ground cut or shaped into artificial surfaces. For the mode of cutting trees and shrubs into regular shapes, see Topiary; and, for laying out the beds so as to form a regular figure, see Parterre.

Gera'nium.--*Geraniàceæ.*--There are few plants more easily grown, or that better repay the care of the cultivator, than Geraniums, or, as they are more properly called, Pelargoniums. All the half-shrubby kinds require a light rich soil, composed of well-rotted manure, leaf mould, sand, and a little loam, kept moderately moist. A cool greenhouse, where the sashes can frequently be thrown off, and a balcony or window, not too much exposed to the sun, are the best adapted for them; and in such situations they may be kept during the whole year, only requiring, when in full flower, to be slightly shaded from the sun, to prolong the blossoming season. Geraniums are readily propagated at almost any season, by cuttings of the points of the shoots, which will strike readily in the same soil as that in which the plant is grown, without either a glass or bottom heat. The nurserymen, however, generally take their cuttings off the points of the shoots, and plant them in the autumn round the edges of pots filled with light rich soil, and plunged into a moderate hotbed. When the cuttings are sufficiently struck, which will be in about six weeks, they may be potted into single pots; or if there should not be room in the greenhouse for so many pots, they may be placed on a tolerably dry shelf, near the glass, till the following spring, when those that are wanted may be potted, and the rest reserved for planting out in open ground, to bloom in the borders during the summer. Geraniums, to make fine plants, and to produce abundance of flowers, should be frequently repotted into larger and larger pots, during March, April, and May; and, should the weather be rather cold, or the plants backward, a little fire put into the greenhouse at night will have a good effect in promoting luxuriant growth and the formation of blossoms. Immediately after the plants have flowered, they should be cut down nearly to the ground, or they will always present an etiolated unhealthy appearance. By thus cutting them down, abundance of fine young shoots will be produced by the autumn, which should be thinned out, and those taken out used as cuttings. In this manner, good bushy plants are insured, and plenty of young plants provided for the next year. Many hundreds of beautiful varieties of Geraniums have been raised from seed, the more remarkable are cross-breeds; that is, those raised from a plant the stigma of which has been fecundated by pollen from the anthers of another variety of the same species. In this respect, cross-breeds differ from hybrids, which are raised from seed fecundated from a plant of a different genus, or, at any rate, a very different species. The use of cross-breeding is thus rather to improve plants, by crossing them with others having a better habit of growth, or more brilliant coloured flowers, than to raise new and striking varieties; and, for this purpose, the plants chosen for the parents should be such as would be greatly improved by admixture with another. For example, a fine bright coloured flower, on a plant of a loose and bad habit of growth, might be crossed by a plant of a dwarf habit, the flowers of which were not beautiful, and so on. The plant that is intended to bear the seed should be carefully watched, and, just before the pollen bursts, the stamens should be cut off. The operator must then wait till the stigma becomes covered with moisture exuding from it; and then, but not before, the pollen from the other plant must be applied with the point of a penknife, or the hairs of a camel's hair pencil. Should the cells of the anthers of the one plant burst before the stigma of the other becomes moist, the pollen may be collected, and kept in paper, till the stigma is ready to receive it. In some cases, pollen has been kept good in this manner for two years; but the moisture of the stigma should be taken advantage of as soon as it appears, as it soon dries up, and cannot be restored artificially. The best time for performing the operation seems to be about the middle of a bright sunny day; and, as soon as it is done, a bit of string, or a strand of bast-mat, should be tied round the stem of the flower, that the seed-pod may be known. As soon as the seeds are ripe, they should be sown immediately in shallow pans of light sandy soil, and set on a greenhouse shelf, where they may be suffered to remain during the winter. Many of the young plants will come up by spring, when they should be immediately potted off into single pots, and treated as before recommended for cuttings.

The following mode of grafting Geraniums is abridged from the "Floricultural Magazine" for May 1840. The stocks should be of the strongest and healthiest kinds, about two or three years old, and rendered bushy by frequent transplanting, and pinching off the leading shoots. The year before they are wanted as stocks, they should be cut down in August to within three eyes (or buds) of the base of each shoot. In the following May the stocks should be transplanted into fresh pots, a size larger than their old ones; and, early in June, they should be "cut down to a clear grown part of the shoot, about two inches from the last year's wood." The stock should then be left two or three days to bleed, that is, to suffer the exuberant sap to escape; after which it may be grafted in the whip or side manner, without a tongue; care being taken to choose "well-ripened shoots, about three inches long, for scions." The principal difficulty arises from the succulent nature of the Geranium shoots; as, if the bark be bruised or wounded during the operation, the grafts will not take; and they are also very easily broken off afterwards.

The herbaceous and tuberous-rooted Geraniums require a much more sandy soil; and, when they have done flowering, they should be put on a dry shelf, near the glass, and very sparingly watered till the spring, when they may be repotted, and treated as above. These may be propagated by cuttings, or division of the roots, in rather dry and sandy soil, and they rarely perfect their seeds in our greenhouses.

The old genus Geranium has been divided by modern botanists into fifteen genera; three of which are quite distinct, and have been already mentioned under the head of Erodium. The kinds usually grown in greenhouses belong to the genus Pelargonium; and of these there are nearly six hundred distinct species, besides innumerable cross-breds, hybrids, and varieties.

GERMANDER.—See TEU'CRIUM.

GEROPO'GON.—*Compósitæ.*—Old Man's Beard. There is only one species of this genus, *G. glàber*, a native of Italy, and which is a very curious plant. It is an annual, having a smooth stem and leaves, and growing about a foot high. The flowers are flesh-coloured, and expand in the form of a star only when the sun shines upon them. The seeds are very curious, and it is from them that the plant takes its English name. They should be sown in the open border, in any common soil, in March or April, and the plants will flower in July and August.

GESNE'RIA, or GE'SNERA.—*Gesneriàceæ.* — Showy hothouse plants, generally with scarlet flowers. They require a light rich soil, and are propagated by cuttings struck in sand under a bell-glass, with the aid of bottom-heat.

GE'UM.—*Rosàceæ.*—Avens. Perennial plants, natives of Europe and America, with very handsome flowers. *G. Quellyon*, Swt. (*G. coccíneum*, Bot. Reg.), is a splendid plant, a native of Chili, with large orange-scarlet flowers. All the species are hardy, and require a light rich soil; they are propagated by seeds, or dividing the roots.

GI'LIA.—*Polemoniàceæ.*—Beautiful annual flowers, natives of California, which only require sowing in spring or autumn in the open border. See CALIFORNIAN ANNUALS, and ANNUALS.

GITHA'GO.—*Silenàceæ*, or *Caryophyllàceæ.*—The Corn Cockle. A British weed, sometimes cultivated in flower-gardens.

GLADES are open spaces of turf among shrubs or trees, of irregular shapes, without definite boundaries, so as to give the idea of something beyond them, of which the extent cannot be guessed. They should vary in width, and be of the most irregular shapes; the types being the open glades which appear in forest or copsewood scenery. Their beauty in pleasure-grounds depends much on the smoothness or high-keeping of the turf, and on the varied ground outline of the branches of the trees or shrubs which repose on it.

GLADI'OLUS. — *Iridàceæ.* — The Corn Flag. The Gladioli or Corn Flags are bulbous plants, with long spikes of showy bell-shaped flowers;

and they are nearly all natives of the Cape of Good Hope. The bulbs, or rather corms, are solid, and do not require taking up if they can be kept dry during winter. The best mode of doing this is by fixing a frame with sashes over them, as this allows of giving them air when fine. When grown in pots, the soil should be very sandy loam, enriched with decayed leaves, and the bulbs should be kept entirely without water, from the time the leaves decay in autumn, till they begin to grow the following spring. Many cultivators take the bulbs out of their pots every September and renew the soil; but others only take them up every third year. At Spofforth, Yorkshire, where the soil is a rich yellow loam, there are clumps of Gladioli, which have been left undisturbed in the open ground for more than twenty years, and which flower magnificently every summer. The only protection given, is covering the clump in autumn two or three inches thick with dry leaves, which are swept up from the neighbouring shrubbery, formed into a heap, rising highest in the centre, and sloping down on every side.

GLASS CASES are of two kinds,—those which are intended to cover plants in the open air, and those which are used for covering plants in rooms, or on the outsides of windows, balconies, &c. Glass cases for the open air may be made of any convenient size or form, so as to cover the plants to be protected; and sometimes they are glazed on every side, though at others they are placed against a wall, and only glazed in front and at the ends. The frame-work may be of wood, or of iron or zinc, so contrived as to separate into pieces, and join together in any temporary manner, in order that the gardener may be able to admit air, or to remove the case entirely, at pleasure. A common hand-glass may be designated the smallest description of glass cases, and a portable greenhouse the largest. Glass cases for rooms consist of two parts, a body or box, containing the mould and plants, and a hand-glass, or glazed case, for placing over it. This case, which may be square or oblong, two feet wide and four or five feet long, should fit into a groove in the box containing the plants; and the plants, when planted and watered, will require no more attention for several weeks, or even months, according to the kind intended to be grown. Hyacinths planted in such a case in November, and placed in a room, will require no attention, except perhaps a little water, till they have done flowering in the following March. Ferns and Cacti will require no attention for a year; but plants which come soon into flower, such as China Roses, or indeed any plants which are coming into flower when planted, require to be removed when they have done flowering, and to be replaced by others. The glazed frames for such cases should be of mahogany or metal, and of neat and accurate workmanship; and plate or German glass ought to be employed. Excellent plans for such cases will be found in the Gardeners' Magazine for 1839 and 1840.

GLASSWORT. See SALICORNIA.

GLASTONBURY THORN.—A variety of the common Hawthorn, that blossoms about Christmas. The legend is, that Joseph of Arimathea having struck his staff into the ground to indicate where Glastonbury Abbey was to be built, prayed, that if he had fixed on the right place, the Holy Virgin would give him a sign of her approval, when instantly the staff (which was a branch of hawthorn) struck root, and shot forth leaves, flowers, and fruit. The original tree of this variety grows near Glastonbury; but plants, grafted from it, are common in all the nurseries.

GLAU′CIUM.—*Papaveràceæ.*—The Horned Poppy. A British plant, common on the shore between Brighton and Shoreham, with glaucous or bluish-green leaves, and large yellow flowers. The pods are long and horn-like, whence the English name. The species are annuals or biennials, and should be grown in a chalky or calcareous soil. The seeds are common in all the seed-shops.

GLECHO`MA. — *Labiàtæ.* — The Ground Ivy. There are two species; one with blue flowers, which is a British weed; and the other, the flowers of which are pink, which is a native of Hungary. They will both grow in any common soil; and, being perennials, are increased by division of the roots.

GLOBE AMARANTHA. — See GOMPHRE`NA.

GLOBE FLOWER.—See TRO′LLIUS.

GLOBE THISTLE.—See ECHI`NOPS.

GLOBULA`RIA. — *Globulárinæ.* — The Blue Daisy. Perennial and suffruticose plants, with round heads of blue flowers, most of which require a green-house in England. All the species grow freely in a mixture of loam and peat, and are propagated by cuttings under a glass.

GLORIO`SA.—*Tulipàceæ.*—*G. supérba* is a magnificent plant, which deserves cultivation in every hot-house. It is propagated by seeds, which ripen freely; or by dividing the roots, which, after the division, which should be in January or February, should be potted in rather small, but deep pots, and plunged into a bark-bed, where they should have very little water till they begin to grow. In March or April the plants should be removed to larger pots; and, while they are growing, they should be abundantly supplied with water. The stems will require to be supported by a stake or trellis; and, if allowed sufficient heat and moisture, they will grow rapidly, and flower beautifully. When the stalks die down, the pots containing the roots should be removed to a dry stove, where they should be kept entirely without water till January or February, when the roots should be divided and repotted. The soil should be composed of one-fourth of peat, one-fourth of leaf mould, and two-fourths of loam.

GLORY-PEA.—See CLIA′NTHUS.

GLOSSOLOGY.—A knowledge of the technical terms of botany.

GLOXI′NIA.—*Gesneriàceæ.*—Very handsome plants, with bell-shaped flowers, that require the heat of a stove; hybrids have, however, been lately raised between this genus and *Sinníngia,* which prove much hardier than their parents. The commonest kinds of Gloxinia are *G. maculàta,* which is apt to become so weak from the great number of its suckers, that unless they are removed as soon as they appear, it will seldom flower; and *G. speciòsa,* which flowers abundantly. The former species is propagated by division of the root, and the latter by cuttings, which strike so freely without a glass, that even a leaf taken off with the base of the petiole entire, will take root, and make a handsome plant. All the species should be grown in a compost of loam, peat, and sand, or in very sandy loam and vegetable mould; and, when beginning to grow, the plants should be well supplied with heat and moisture. The pots should, indeed, stand in a saucer kept half full of water.

GLY′CINE`. — *Leguminòsæ.* — Climbing, tender plants, with pea-flowers. The Linnæan genus Gly′cine, has been divided by modern botanists into eleven genera, the best known of which is Wistària. ***Wistà-***

ria Consequàna, *chinénsis*, or *sinénsis*, sometimes called by its old name of *Glýcine sinénsis*, is one of the most valuable climbing trees that will grow in the open air in Britain. This tree, which, though now so common, was only introduced in 1816 or 1818, is a native of China, and appears to be quite hardy in the neighbourhood of London. Its large bunches of beautiful shaded lilac flowers, which are fragrant, are exactly like those of the common laburnum, except in colour; and they are produced most abundantly, the tree, in favourable situations, often bearing a second crop.

The *Wistària sinénsis* will grow in any common garden soil; but it does best when the soil is light and rich, and the plants are abundantly supplied with water. It is often several years before it flowers, as it takes a long time to establish itself; but the period of its flowering may be hastened by watering it regularly with liquid manure, or by telling the housemaid to empty the slops and soap-suds on the ground near it—taking care to pour the liquid on the ground at a distance from the stem of the plant, as it would injure the collar if poured on it. All watering is, indeed, most effectual when it is given at some distance from the stem of the plant, as it is only the spongioles at the extreme points of the roots that can take up the moisture so as to be of any service; and water, if poured on any other part that is under ground, is in danger of rotting both the epidermis and the cellular tissue. When once established, the Wistària grows vigorously, and the plant in the Horticultural Society's garden at Turnham Green being checked in its height by that of the wall against which it grows being only eleven feet, has spread so far on each side, as to cover a space of above three hundred feet in extent. It is easily propagated by layers, as the shoots, if laid down, will throw out roots at every joint. It may also be propagated by cuttings of the roots and branches, and even by leaves, which will take root if planted in sand and peat, and covered with a glass, provided care has been taken to break the petiole off the branch without wounding the protuberance at its base. Seeds of this plant are very rarely ripened in England; but when they are, they vegetate as readily as those of the common laburnum. The plant requires a wall or trellis-work to support it; but any aspect will do. Mr. Pamplin, of the Lavender Hill Nursery, has a plant which is trained against three sides of his house; viz. the north, the east, and the south; and the only difference he perceives is, that the flowers on the south wall expand first, but are the weakest and palest, and that those on the north, though they are the latest, are the darkest and most vigorous. The *Wistària sinénsis*, though so beautiful, is by no means dear, as a plant costs from 1*s*. 6*d*. to 2*s*. 6*d*. in the nurseries, according to its size—a plant of the latter size being the largest that can be transplanted with safety.

GLYCYRRHI'ZA.—*Leguminòsæ.*—The Liquorice. A perennial plant with small pale blue flowers, a native of the south of Europe. The liquorice is made by boiling the root (which resembles that of the ginger in appearance) a long time, and letting the moisture evaporate from the sediment. The plant is not worth cultivating except from curiosity; but when it is grown, it requires a very rich mould.

GNAPHA'LIUM. — *Compósitæ.* — Cudweed. This genus now includes only about half the number of species that it formerly did, six or seven new genera having been formed out of it. The British species are cottony looking weeds, and very few, if any, of the foreign kinds are worth cultivating. The French *Immortelle*, of which such quantities are sold near the Cemetery of Père la Chaise, and which used to be called *Gnaphàlium orientàle*, is now removed to the genus Helichrysum.—See HELICHRY'SUM.

GNI'DIA. — *Thymelàceæ.* — Very pretty green-house plants, which are rather difficult to cultivate, from the great delicacy of their roots. They should be grown in a mixture of sand and peat, or in what is called heath-mould; and they should never be suffered either to flag for want of water, or to stand in saucers full of it. All the species are rather difficult to propagate; but the best way is to take off the tips of the shoots when quite young, and to plant them in pure sand under a bell-glass.

GOAT'S BEARD.—See TRAGOPO'GON.

GOAT'S RUE.—See GALE'GA.

GOAT'S THORN. — *Astrágalus Tragacántha.*

GODE'TIA. — *Onagràceæ.* — The purple-flowered kinds of Œnothèra, or Evening Primrose, have been divided from the others and formed into a genus, under the name Godètia, by Professor Spach, a German botanist, residing in Paris. Professor Spach formed thirteen other genera out of Œnothèra, but only this one appears to have been generally adopted. The handsomest species of Godètia are *G. rubicúnda, G. vinòsa*, and *G. lèpida*, all natives of California, introduced in 1835, and all of which may be sown in September, like the other Californian annuals. See ANNUALS. The other kinds are also all hardy annuals, which require no other care than sowing in March or April in the open border, in any common garden soil, and thinning out when they come up, if they appear too thick. All the Godètias are rather tall growing plants, and, if not thinned out, they will become drawn up and etiolated. If the plants appear weak, they should be tied to slender stakes. They bear transplanting well. The colours are most brilliant when grown in a poor soil; but the plants are smaller and less vigorous. A rich soil makes them produce more leaves than flowers.

GOLDEN ROD.—See SOLIDA'GO.

GOLDEN SAXIFRAGE. — See CHRYSOSPLE'NIUM.

GOLDEN THISTLE.--*Scólymus grandiflòra.*

GOLDFU'SSIA. — *Acanthàceæ.* — A new name given by Professor Nees Von Esenbeck to *Ruéllia anisophýlla.*

GOLDYLOCKS.—*Ranúnculus auricòmus.*

GOMPHOLO'BIUM.—*Leguminòsæ.*—Australian shrubs, which require to be kept in a green-house in England, and to be grown in very light loam, peat, and sand. All the species are very difficult to preserve; and they are all very tender, delicate plants. They require to be trained to a frame; and they are easily killed, either by too much or too little water. They are propagated by seeds, which ripen frequently; or by cuttings of the young wood, which must be struck in sand, under a bell-glass.

GOMPHRE'NA.—*Amaranthàceæ.*—The Globe Amaranth. This is supposed to be the Amaranth of the poets, which, from the durability of its flowers, was considered to be the emblem of immortality. It seems to have been used at funerals in the time of Homer, as he describes it as worn by the Thessalians at the funeral of Achilles, and it is still used for the same purpose in various parts of the Continent. The plant is a tender annual, which should be raised on a hot-bed or in a stove, and which, even when in flower, should be kept in the green-house. It should be grown in a light rich soil, and kept rather dry. Sometimes it is propagated by cuttings, struck in mould under a hand-glass; and plants raised in this manner are generally much hardier than those from seeds.

GONGO'RA.—*Orchidàceæ.*—Curious epiphytal plants, natives of the tropics, which require the usual treatment of orchideous plants, and are generally grown in a moist stove, or orchideous house, in baskets of moss, or on a piece of wood hung up to the rafters. Sometimes they are grown in pots, in peat and sand, mixed with pieces of broken stone or lime rubbish. The flowers hang down from the root, and require to be shaded from the direct rays of the sun. They are increased by division of the root; and, when grown in pots, the pots should be half filled with potsherds.

GONO'LOBUS.—*Asclepiadàceæ.*—Climbing plants, with dark red flowers, which require the heat of a stove. They should be grown in a mixture of loam and peat; and they may be increased by cuttings. The flowers are more curious than beautiful.

GORDO'NIA.—*Ternstrœmiàceæ.*—The Loblolly Bay. This plant, though in its native country, the swamps of North America, it becomes a tree fifty or sixty feet high, is in England rarely more than a sub-evergreen bush, the height of which seldom exceeds five or six feet. It is nearly allied to the Camellia, and it has large, white, sweet scented flowers, and handsome leaves. It should be grown in peat earth, kept moist, in a low sheltered situation; but it is quite hardy, and will grow in any soil or situation, flowering abundantly when of very small size. It is generally propagated by layers; but when seeds are imported, they should be sown on wet moss, as they are said only to germinate well on that substance.

GOSSY'PIUM.—*Malvàceæ.*—The Cotton Tree. These plants, most of which are natives of the East Indies, require a stove in England. The flowers are large and handsome, resembling those of the Mallow, and the seeds are enveloped in a soft, white, woolly substance, which is the cotton. This substance is often produced in England. All the cotton plants are herbaceous, and most of them are biennials; and they all require a rich moist soil, and abundance of heat. They are propagated by seeds and cuttings.

GRABO'WSKI.—*Solanàceæ.*—The new name for *Lýcium Boerhaviæfòlium.* See LYCIUM.

GRAFTING is the art of taking a shoot from one plant and uniting it to another, in such a manner as that it shall grow and thrive as well as if it were planted in the ground. A grafted plant consists of two parts; the stock, which must have a root, and the scion, which is united to the stock by the operation of grafting. The scion is commonly a shoot of the preceding year's growth: but, in some cases, it may be a shoot of the same year's growth, or it may be of the growth of two or more years. The stock should be a well-rooted plant, fixed in the soil, with a stem of at least as great a diameter as that of the scion, but the stem may be much larger, and of several years' growth. Grafting is commonly limited to woody plants, and it is only within certain limits that it can be performed. To be united together by grafting, it is necessary that the plants be of the same nature; and, generally, that they be of the same genus, or family; though, in some cases, all the genera of a tribe will graft on one another. Thus, any kind of Camellia may be grafted on any other kind of Camellia or Tea Tree, but not on any other genus; while any kind of Pyrus may not only be grafted on any other kind of Pyrus, but also on Cratægus, Mespilus, Sorbus, Cydonia, and perhaps several others.

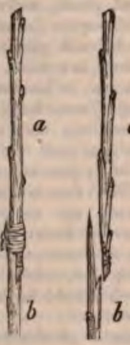
The primary cause is probably to be found in the organisation of the respective tissues of the plants, those uniting which are alike; but as this can only be determined by microscopic observation, and only then by the most acute vegetable anatomists, the safe rule in practice is to limit our attempts at grafting to species of the same genus.

The uses of grafting are various. By grafting a weak growing species or variety on a strong growing kind, the weak growing variety becomes more vigorous; and, consequently, a large and handsome plant is much sooner produced than could be done by layers, cuttings, or seeds. On the contrary, by grafting a strong growing plant on a weak, low, or slow-growing stock, dwarf plants are produced, and thus specimens of large trees may be obtained within a very limited space. Plants may be propagated by grafting that cannot be increased readily by any other mode; as is the case with common fruit trees. The shoots of seedling plants grafted on a stock of several years' growth, will sooner produce blosoms and fruit than when left to grow on their own roots.

There are various kinds of grafting; but they are all founded on this essential condition, viz. that the inner bark of the scion should be closely united to the inner bark of the stock. Where the scion and the stock are of the same thickness, this may be done at both edges; but where the stock is thicker than the scion, it can only be done at one edge, which, however, is found sufficient. The kinds of grafting best adapted for ladies, are the common splice, or whip-grafting; slit, or cleft-grafting; side-grafting, and inarching.

Whip, or splice-grafting, is represented in the cut *fig.* 15, in which *a* is the scion, and *b* the stock. In this case, both scion and stock are of the same thickness; both are cut slanting, so as exactly to fit; and there is a dovetail notch in the stock for the scion to rest on. When the scion has been perfectly fitted to the stock, it is tied with a strand of matting, as shown in the figure, and afterwards covered with grafting-wax, or grafting-clay, the modes of making which will be given afterwards. There are different variations of this mode of grafting. Sometimes the dovetail notch is omitted, and at others a tongue is formed in the scion, and a slit made in the stock, into which it is inserted; this tongue serving the purpose of the dovetail notch, viz. to keep the scion in its place. When the stock is of much larger diameter than the scion, the appearance of this graft is, of course, quite different, and

FIG. 15.

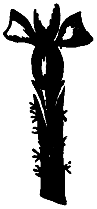


WHIP, OR SPLICE GRAFTING.

the latter is put on at one side, in order that its inner bark may be closely united with that of the stock. This is the common mode of grafting fruit trees in the nurseries.

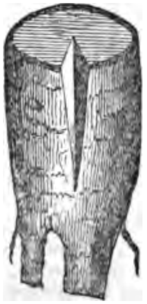
Slit, or cleft-grafting, is performed by first cutting over the stock, and next making a slit or cleft in it; then paring the scion on both sides, so as to form a wedge, narrower at the inner edge; and, after inserting it in the cleft, tying it and claying it as before. This mode is well adapted for grafting one succulent plant on another; as, for example, in the Cacti tribe, grafting an Epiphyllum on a Pereskia, as shown in *fig.* 16, or for grafting ligneous Peonies on the tubers of herbaceous ones, as shown in *figs.* 17 and 18. In *fig.* 17, *a* is the stock already notched; and, in *fig.* 18, *b* is the prepared scion, and *c* the grafted plant.

FIG. 16.



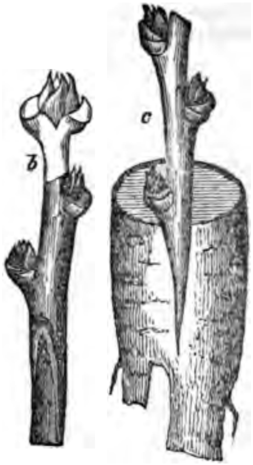
GRAFTING THE CACTI.

FIG. 17.



GRAFTING THE PEONY.

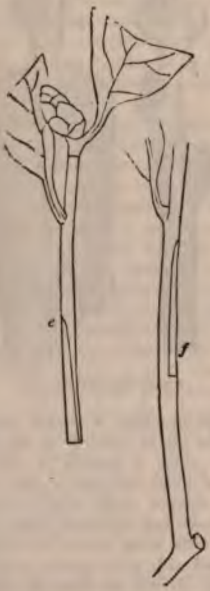
FIG. 18.



GRAFTING THE PEONY.

Side-grafting is shown in *figs.* 19 and 20, in which *f* is the stock, from which a portion is cut out, against which the scion *e*, also somewhat thinned down, is to be applied and made fast, as shown in *fig.* 20 at *g*. This being done, the graft is covered with grafting-wax or clay, as usual. It will be observed, that by this mode the head of the stock is not cut off, but is left on, in order to draw up the sap, and also to prevent the stock from being disfigured in the event of the death of the scion. There is another mode of side-grafting, which is much more certain of success, in which the head of the stock is cut off, as shown in *fig.* 21, in which it will be observed, that the lower end of the scion is inserted in a bottle of water, to supply it with moisture; a practice which, though not absolutely necessary, is found advantageous. In this kind of side-grafting the scion and the stock are cut as shown in *fig.* 19. Formerly, Camellias were very frequently grafted in this manner, as shown in *fig.* 21.

FIG. 19.

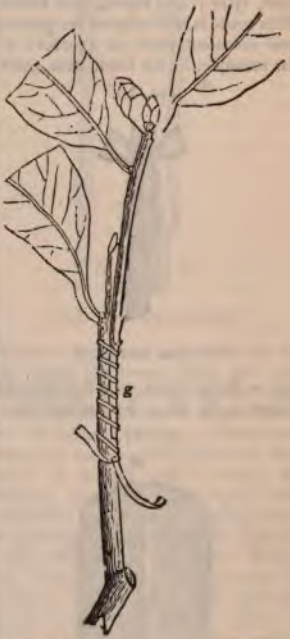


STOCK AND SCION PREPARED FOR SIDE-GRAFTING.

Inarching differs from the other kinds of grafting, by preserving the scion attached to the parent plant till it has become united with the stock in such a manner as to derive its nourishment from it. For the mode performing the operation, see IN-NG.

To graft with success, the operation is best performed in spring, immediately before the buds of the scion begin to expand; and, in general, the scion ought, in this respect, to be in advance of the stock; a result which is obtained by cutting off the scions from the parent plant in the winter season, and inserting their ends in the soil in a cool shady place in the garden till they are wanted in spring. In performing the operation, it is necessary to have a very sharp knife; for if the slightest roughness is left on the

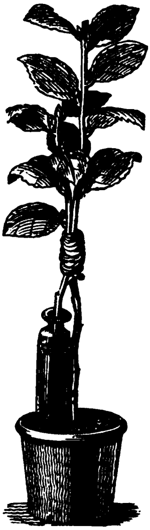
FIG. 20.



SIDE-GRAFTING WITH THE SCION BOUND ON THE STOCK.

parts of the scion and the stock which are to be united, their perfect union cannot be effected. The operation ought also to be performed with rapidity, so as to expose the naked sections of the scion and stock for as few moments as possibe to the atmosphere. When the plants to be grafted are in pots, they should immediately afterwards be placed in a gentle heat, and kept moist; and, if covered with a bell-glass, so much the better. The latter practice may be considered as essential in the case of grafted orange trees, Camellias, Rhododendrons, Daphnes, Arbutus, Magnolias, &c. Grafts made in the open air, on very small plants, may sometimes be covered with hand-glasses, or slightly sheltered or shaded till they have begun to grow; and the soil may be covered with litter, or rotten tan, or leaves, to retain the moisture. Where no pains are spared, the soil may be warmed immediately after grafting, by watering it with a few pots of hot water. After the scion has made shoots a few inches in length, the clay may be removed and the matting loosened; but care must be taken not to do this too soon. The proper time may always be known by observing whether the edge of the scion exhibits a granulating process, closely uniting it with the stock. In general, in the course of the month of August, all the matting from plants grafted in the open air may be removed; and with those under glass, this may be done much sooner.

FIG. 21.



GRAFTING, WITH THE END OF THE SCION IN A BOTTLE OF WATER.

Grafting clay is made of clayey loam, or brick-earth, mixed with about a fourth part of fresh horse-dung, free from litter, and a portion of hay cut into pieces about an inch in length, adding a little water, and beating the whole together for several hours. On a small scale, however, this preparation is not necessary; as either moist clay alone, or cow-dung, may be plastered over the graft, and covered with moss, or even with coarse paper; the moss, or paper, being tied on with matting. The use of the covering is to exclude the air, and consequently to retain the moisture of the scion and stock, and also an agreeable degree of temperature, in order that the vessels of the two woods may be able to unite.

Grafting wax is composed of bees-wax and pitch, with some tallow, and a little rosin; at first melted and mixed together, and afterwards beated as wanted. The proportions are of no great consequence. The mixture is kept in an earthen pot, in which it may be heated when wanted; and it is laid on with a brush till it is a quarter of an inch thick; and, if covered with dry sand while it is still soft and warm, it will not be likely to melt and fall off, which otherwise would probably be the case.

Grains of Paradise. The berries of *Cócculus índicus.*

Grape Hyacinth. See Musca'ri.

Grasses. There are but very few ornamental kinds of grass that are worth cultivating in a garden; and the most remarkable of these are the Quaking Grass, *Brìza mèdia*, and the Feather Grass, *Stìpa pennàta.* The Italian reed, *Arúndo Dònax*, and its variety, the Ribbon Grass, *A. D. versícolor*, are very ornamental; but they are reeds rather than grasses, though they belong to the same natural family, *Gramíneæ.* For a list of the grasses proper for laying down a lawn, or grass plat, and their qualities, see Lawn.

Gravel is in universal use for forming walks in Britain; as sand is, for want of gravel, on the Continent. The grand desiderata in gravels are: the quality of binding, or forming a smooth compact body, not liable to be disturbed by the feet in walking; and a good colour which shall harmonize agreeably with the grass and trees, &c., around it. It is a very common practice in forming gravel-walks, to use the gravel as it comes from the pit, and, after it is laid down and rolled, to cover it with sand taken from the same gravel by screening or sifting; but unless this sand be of a binding nature from its containing a good deal of iron, it soon separates from the rough gravel below, and is removed by sweeping. Gravel, whether consisting of large or small stones, or particles, if laid down when perfectly dry, very seldom can be made to bind; and, under such circumstances, it forms a rough, moving, and consequently a most disagreeable surface to walk on. A remedy for evils of this kind, which is sometimes successful, is to strew over the walk Roman cement in powder, then to rake it so as to incorporate the powderd cement with the surface of the ground to the depth of two or three inches, and immediately afterwards to water it thoroughly, and roll it till it becomes quite hard and smooth. This is one of the best modes of forming a permanent and agreeable gravel-walk on a steep slope; it is also an excellent mode in small gardens, where the object is to save labour in keeping, and to prevent the growth of weeds. Sea-shore gravel, which is generally mixed with sand and shells, can only be rendered firm by this process, or by one which destroys its colour, viz. mixing it with tar or gas liquor. When so mixed, however, it forms a very durable walk, though it is of a dark and disagreeable colour. Next to these modes, the best means is to break a number of small stones, or pebbles, into fragments; and if this be done with about one-third of the quantity of gravel to be used, and the fragments intimately mixed with the round pebbles, the gravel, when thoroughly rolled with a very heavy roller, will bind. The finest gravel in the world is composed of the debris of flints, such as the Kensington gravel; and this kind, which has hitherto been found in only a few parts of England, is sent to every part of the world.

It must always be remembered, that broken angular pieces of stone, whether large or small, will bind much better than round pebbles; and if with the broken stones be mixed a ferruginous clay, which is generally of a reddish, brownish, or yellowish colour, and the whole be rolled immediately after it is laid down, it will harden by exposure to the atmosphere, and will become quite firm and smooth. If, however, the rolling should be neglected for a few days, the particles of rusty earthy matter will become hardened individually in a loose state; and even if rolled afterwards, they will never become quite firm. It must also be observed, that large and small stones do not bind well together; and hence all gravel, as soon as it is taken from the pit, should be sifted through a wire screen, the wires of which are only sufficiently wide apart to admit stones of the size of a moderately large gooseberry, and all the larger stones should be thrown on one side to be broken. The gravel that has passed through the screen should then be examined, and if it be found mixed with too much earthy matter, it should be again sifted through a wire sieve, sufficiently fine to allow only the earth to pass through. Part of the earthy matter should then be well mixed with the gravel and broken stones, in the proportion of one third of each, and the whole should be laid evenly on the walk, and rolled immediately.

When gravel walks have become loose from time or frequent sweeping, or from the gravel being originally of a bad quality, they may be rendered firm by forking them over; and, after raking out the largest of the stones, and breaking them, mixing the gravel with equal parts of sand and ferruginous clay in a somewhat moist state; rolling the whole as soon as the materials have been equally spread over the walk. If, however, neither sand, nor ferruginous clay can be easily procured, burnt common clay powdered may be mixed with the gravel; the clay having been burnt by spreading it on the furnace of a hothouse, or by mixing it with faggots, and then setting fire to the whole; but in this case also, care must be taken that the mixed clay and gravel are watered after they are laid down, and immediately after rolled.

There are various substitutes for gravel. Where colour is the object, as well as firmness and smoothness, there is nothing better than burnt lumps of clay, reduced to a very coarse powder, and slightly mixed with Roman cement. Where colour can be dispensed with, a most effective garden-walk, and one which will last for many years, may be formed of the scrapings of public roads, which have been made, or metalled, as road-makers term it, with granite, or other coarse stone, mixed with tar, laid down to the depth of six inches on a bottom of broken stone, and smoothly and firmly rolled. The different kinds of asphalte so laid down also make smooth and durable walks; but they are too expensive for general use. Where no gravel can be procured, granite or other stone, broken very small, and firmly rolled, will make a very durable walk, though the colour is far inferior to that of fine yellow gravel. For laying out walks, and the mode of preparing the foundation of gravel walks, &c., see WALKS.

GREEK VALERIAN. — See POLEMONIUM.

GREENHOUSE. — A structure for growing those plants in (more particularly in the winter season), which will not endure the open air of British winters. It may be of any form, but the most convenient is a square or a parallelogram, with upright glass in front, sufficiently high to admit of walking upright under it immediately within the glass; and with a sloping roof, at such an angle as readily to throw off the rain. This roof, for the better receiving the sun's rays, should face the south, south-east, or south-west, and this is called the aspect. The front should seldom be lower than seven feet in height, and the height of the back should be about two-thirds of the width of the house. The space within is generally laid out so as to have a shelf in front, about two feet high from the ground, and two or three feet in width; and next there is a path two or three feet in width; the remainder of the floor, from the edge of the path to the back wall, being occupied with a series of shelves, rising one above another like the steps of a staircase, on which the pots of plants are to be placed. These shelves may be nine inches or a foot in width, and the height of one above another may also be nine inches or one foot. The mode in which artificial heat is communicated to such a house is by smoke flues, or hot water pipes. The fire should be at one end, or behind the house, whichever may be most convenient; and the principal flue or hot-water pipe should be along the front wall, under the shelf; or, in some cases, it may be under the path. The reason for this position of the flue or pipe is, that heat always ascends; and, consequently, if the source of heat were placed under the back of the house, the heat would ascend directly to the roof at the upper angle of the house, and would scarcely heat the lower or front part at all. In order to admit of ventilation, the front sashes should open outwards, or slide along a groove; and the roof sashes should also open by sliding the one over the other. Other minor details need not be here entered into, as they are perfectly understood by all constructors of greenhouses, whether of wood or iron. With respect to these two materials, iron admits of the greatest variety of shape, such as a curvilinear ground plan and roof, and it also admits most light; but the construction in wood is most generally understood, and is rather the cheapest. Very excellent and ornamental greenhouses in iron are constructed by Messrs. Cottam and Hallen, and wooden houses may be made by any carpenter or joiner.

Greenhouse Plants are those which will not bear the cold of a British winter in the open air, but that only require to be protected from frost. Many persons injure their greenhouse plants by giving them too much heat in winter, and too little air in summer, and are then surprised to find their plants die, or at least become sickly, and remain without flowering, notwithstanding all the care that has been bestowed upon them. No greenhouse ought to be kept at a greater heat at night than from 35° to 40° during winter; but the thermometer ought never to be suffered to fall below 35°. In the day, particularly if there be sunshine, it will of course rise higher; but the fire should be lessened accordingly, as the thermometer, even in sunshine, should not rise in winter above 50°, or at most 52° or 53°. A higher temperature will induce premature vegetation; and the plant will waste its strength in an abortive attempt to produce flowers and seeds at a season when its nature requires it to be kept in a state of complete repose. The second fault, of giving too little air, is an equally serious one. Plants can no more live without fresh air than without water; and even in winter, the sashes of a greenhouse should be opened for an hour or two, say from twelve till two, in the middle of the day, whenever the sun shines, or the frost is not too intense. In the summer, say from the middle of May to the middle of September, the plants should be set out in the open air; the space on which they are to stand being covered two or three inches deep with small coal or slack, or ashes, to prevent the worms from creeping out of the ground into the holes at the bottom of the pots. In cold and damp seasons, the time for putting out the plants may be delayed till June; and previous to their removal, the sashes of the greenhouse should be left open for a week or ten days, night and day. Greenhouse plants should be watered regularly every evening in summer, and twice a-day if the weather be very hot and dry. In winter, they should always be watered in a morning, when water is given; but this need not be every day. Some plants, indeed, do not require watering oftener than once a week. The general rule is frequently to examine the pots, and to give water whenever the earth appears to have become dry on the surface. Greenhouse plants should never be suffered to stand in saucers during winter, as stagnant water is particularly injurious at that season; and whenever the earth in a pot looks black and sodden with water, the plant should be turned out of the pot, and, after the black earth has been shaken from its roots, it should be repotted in fresh soil, well drained with broken crocks or cinders. In February or March, the plants should be looked over, and repotted where necessary; those that are too tall should be cut in, and cuttings made of their shoots. The young plants raised from cuttings made in autumn should be repotted in larger pots for flowering; and where the plants do not require fresh potting, but have the surface of their mould become green and mossy, the moss should be taken off, and the ground slightly stirred with a flat stick, taking care, however, not to go so deep as to injure the roots. When trouble is not an object, all greenhouse plants are the better for repotting once every year, either in spring or autumn; and when the ball is taken out of the pot for this purpose, it should be carefully examined, and all the decayed parts of the roots should be cut off. Sometimes, when the ball of earth is turned out, nearly half of it will fall off almost without touching; and when this is the case, it will generally be found that there is a worm in the pot. Worms do a great deal of mischief to greenhouse plants in cutting through the roots, as their instinct teaches them to make their way through the earth straight across the pot and back again; and they cannot do this without tearing the roots asunder every time they pass. Another point to be attended to in the management of a greenhouse is, keeping the plants as near as possible to the glass; as, unless this is done, the plants will become what gardeners call "drawn up," and unnaturally tall and slender, from the efforts they make to reach the light.

Grevi'llea.—*Proteaceæ.*—Australian plants, with very curious flowers, which should be grown in a mixture of equal parts of sand, loam, and peat. They are increased by seeds, which ripen freely, or by cuttings of the old wood, in sand, under a bell-glass.

Griffi'nia.—*Amaryllidaceæ.*—Handsome bulbous-rooted plants, which require the heat of a stove, and which should be grown in equal parts of white sand, loam, and peat. They should be allowed a season of complete rest in winter, and abundantly supplied with water when they begin to grow after repotting in spring. They should have plenty of air; and they are increased by offsets, which should be taken off when they are repotted. They flower in autumn.

Grinde'lia, *W.*; (**Do'nia,** *R. Br.*) —*Compósitæ.*—Perennial and annual plants, with large showy yellow flowers. The leaves of some of the species are covered with a white glutinous matter, that looks like milk. Nearly all the species are natives of Mexico, and they should all be grown in a mixture of loam and peat. The perennial species all require the protection of a frame during winter.

Grottoes are covered seats, or small cells or caves, with the sides and roof constructed of rock-work, or of brick or stone, covered internally with spar or other curious stones, and sometimes ornamented with marine productions, such as corals, madrepores, or shells. A kind of grotto is also constructed of roots ornamented with moss. Perhaps the most generally effective grotto is one formed with blocks of stone, without ornaments either externally or internally, with the floor paved with pebbles, and with a large long stone, or a wooden bench painted to imitate stone, as a seat. The roof should be rendered waterproof by means of cement, and covered with ivy ; or a mass of earth may be heaped over it, and planted with periwinkle, ivy, or other low-growing evergreen shrubs, which may be trained to hang down over the mouth of the grotto. In some cases it answers to cover grottoes with turf, so that when seen from behind they appear like a knoll of earth, and in front like the entrance into a natural cave. As grottoes are generally damp at most seasons of the year, they are more objects of ornament or curiosity than useful as seats or places of repose. One of the finest grottoes in England is that at Pain's Hill, formed of blocks of stone, with stalactite incrustations hanging from the roof, and a small stream running across the floor. Pope's grotto at Twickenham; the grotto at Weybridge, and that at Wimbourne St. Giles, which last cost 10,000*l.*, are also celebrated. A fountain or a gushing stream is a very appropriate ornament to a grotto; though, where practicable, it is better in an adjoining cave, when a person sitting in the grotto can hear the murmur of the water, and see the light reflected on it at a distance, than in the grotto itself.

Ground Cherry.—*Cérasus Chamæcérasus.*

Ground Ivy.—See Glechoma.

Groundsel.—*Senècio vulgàris.*—I mention this troublesome weed, to enforce on amateur gardeners the necessity of pulling it up as soon as it appears, without suffering it to open its flowers, lest it should ripen any of its seed. The plant belongs to the Compositæ, and the seeds are each furnished with a feathery wing or pappus, by means of which they are distributed in all directions.

Groundsel-tree.—*Báccharis halimifòlius.* A shrub with blueish green leaves, and rather pretty flowers, which are produced in autumn. It will grow in any common garden soil, but it is killed in severe winters if in an exposed situation. It may be propagated by cuttings, which will strike if planted in the open border in autumn ; or by layers.

Guai'acum.—*Zygophylleæ.*—Lignum-vitæ tree. Hothouse trees which are grown in loam and peat, and propagated by cuttings. When transplanted, great care should be taken not to injure the roots, which are small and very brittle.

Gua'va.—See Psidium.

Guelder Rose.—See Viburnum.

Guernsey Lily.—*Nerìnè sarniénsis*, Ker.—See Neri'ne'.

Gypsoca'llis, Sal.—*Ericaceæ.*—The moor, or Cornish heath, separated from the genus Erica by Salisbury. For culture, see Erica.

Gypso'phila.—*Carophyllaceæ*, or *Silenaceæ.*—Small-flowered creeping or trailing plants, annuals and perennials, which require a calcareous soil, and are well adapted for rockwork.

Gypsum.—Sulphate of lime, commonly called plaster of Paris.

Gum Arabic Tree.—*Acàcia vèra*, or *Arábica.*—See Acacia.

Gum Cistus.—*Cístus Cýprius*, or *ladaníferus.* See Ci'stus.

H.

Habena'ria. — *Orchidaceæ.* — Hardy North American perennials, with tuberous roots, and very curiously shaped flowers, which are generally yellow, but sometimes purple, and sometimes white. They grow best in a shady situation, and in a peat soil, kept rather moist than dry.

Habra'nthus—*Amaryllidaceæ.*—Bulbous-rooted plants, (some of which will thrive in the open ground, though others require a greenhouse, and others a stove,) the culture of which exactly resembles that of the Amaryllis. The flowers are also similar, though very much smaller; and, as in the Amaryllis, they are produced before the leaves. The Habránthus appears to exemplify the doctrine of bulbs being under-ground stems; for we are told by the Hon. and Rev. W. Herbert, (*Bot. Mag.* t. 2597,) that the bulbs of this species, though round when imported, after having been potted a year become gradually elongated. Plants of this genus are generally grown in a mixture of sandy loam and peat; and for the details of their culture, see Amaryllis.

Hæma'nthus. — *Amaryllidaceæ.* — Bulbous plants, with large red flowers of very singular appearance and no particular beauty. They are very coarse-growing, and take up a great deal of room. *H. multiflòrus* is, however, an exception, as it is rather pretty. All the species require the heat of a greenhouse, and to be grown in sandy loam and peat; they should also have a season of complete rest. For the rest of their culture, see Amaryllis.

Hæmato'xylon. — *Leguminosæ.* —The logwood. This tree, which grows about twenty feet high in its native country, is a stove-shrub in Britain. It has yellow flowers, and should be grown in a mixture of peat and loam.

Ha'kea.—*Proteaceæ.*—Australian shrubs, with flowers somewhat resembling those of the Grevillea, which are generally sweet-scented. The plants are generally kept in the greenhouse, should be grown in peat and sands, mixed with a little loam, and the pots should be well drained, and never suffered to become either too wet or too dry. See Australian Shrubs.

Hal'esia.-*Halesiàceæ.*--The Snowdrop-tree. American low trees, which generally form very handsome hardy shrubs in British pleasure-grounds. The reason of this is, that in North America the species all grow on the banks of rivers, in very poor rocky soil, whereas in England they are grown in dry places in rich soil; and too much nourishment to a tree which does not require it, has the same effect as too much animal food to a child—it makes it increase in width instead of height. The Snowdrop-tree flowers freely, and its stem droops gracefully over water. The flowers are white, and resemble those of the snowdrop; and the seed is curiously winged. The species will grow in any soil or situation, but they all prefer a poor soil near water, and a sandy situation. They are generally propagated by layers, though they all ripen seed abundantly in England.

Halimode'ndron.— *Leguminosæ.* —The Salt-tree. *H. argénteum*, Dec. (*Robínia Halimodéndron*, Lin.) is a Siberian hardy shrub, which will grow in any soil or situation. When grafted standard high on a laburnum, it forms a very handsome drooping tree, with silvery leaves and purple flowers.

Hamame'lis. — *Hamamelaceæ.* — The Witch Hazel. A hardy shrub, a native of North America, which will grow freely in any soil that is not too rich, though it prefers a dry stony gravel. It has the peculiarity of flowering during winter, beginning to expand its rich deep yellow flowers just as its leaves are falling off, and dropping its flowers when its branches begin to be reclothed with leaves in spring.

Hand-glasses.—Portable frames or covers, formed of iron, zinc, or wood, and glazed. These glasses differ from bell-glasses in being longer, and composed of numerous small pieces of glass, which are fastened together by narrow strips of lead. Hand-glasses are generally square, but they may be made of an octagon, or any other shape that may be found most convenient; and they are sometimes made with a pane to open to admit air, or with the upper part to take off. This is very convenient; for as hand-glasses are chiefly used for protecting half-hardy plants during winter, it is necessary to give them air every fine day, and it is very troublesome to be obliged to lift the hand-glass off the plant, and to lay it on one side whenever this is done. Bell-glasses, on the contrary, being principally for preventing the evaporation of moisture from the leaves of cuttings, do not require any opening, as the plants seldom want any air till they have rooted.

Hardenbe'rgia.—*Leguminosæ.*—A new name given by Mr. Bentham to *Kennèdya monophýlla*, and five other species of that genus, which have small purplish flowers.

Hardy plants are all those that will stand the open air in British gardens without the slightest protection; half-hardy ones are those that may be planted in the open ground, but require the protection of a mat or hand-glass; and tender, those that must be kept during winter in a hot-bed or plant-house heated by artificial means. Greenhouse and frame plants are those grown in pots, which require protection from frost during winter; and stove plants are those grown in a hothouse all the year.

Harebell. It is rather curious, that though few poets can write a sonnet without mentioning the harebell, and though it is sure to be introduced in every eloquent prose description of country scenery, botanists cannot exactly decide what plant is meant by the name—some supposing it to be the beautiful little blue *Campánula rotundifòlia*, and others, the wild hyacinth, *Scílla non-scripta.* The fact is, that both plants are now known by the name in different parts of Britain: but as the original word is said to have been "air-bell," it is most probable that it was the campanula that was first so designated, and that is alluded to by the poets; as the tender blue of its flowers is so near the colour of the skies, as not to require any great exertion of poetic fancy to call it a bell of air; and as its slender stem has sufficient elasticity to rise again when lightly trodden on.

Hares and Rabbits do a great deal of mischief to flower-gardens, as they are very fond of devouring many flowering plants—particularly pinks and carnations. They are also very fond of young plants of laburnum in the shrubberies, and of parsley in the kitchen-garden. The usual way of protecting pinks and carnations is, by an invisible wire fence, or by a net-work of black worsted, supported at intervals by blackened wires; but the young plantations are generally protected by common netting supported by notched stakes. Some persons sow parsley near their carnations, in the hope that the hares will eat that in preference; but it often proves injurious, as the smell of the parsley attracts more hares than would otherwise discover the carnations, and thus the parsley being soon devoured, the carnations are completely destroyed.

Hare's-ear.—See **Bupleurum.**

Hare's-foot Fern. — *Davállia canariénsis.*—A very curious exotic fern, the roots of which grow out of the pot, and closely resemble a hare's foot. It is a native of the Canaries, and should be grown in sand and peat.

Hart's-tongue.— *Scolopéndrium officinàrum.*—One of the handsomest of the British ferns, from its broad tongue-shaped leaves. It grows in marshy places. It is called Scolopendrium from its roots bearing some resemblance to the little luminous insect, *Scolopendra electrica.*

Hatchet Vetch.—*Coronílla securidàca,* now called *Securígera Coronílla.* A coarse-growing hardy annual, which takes up a great deal of room, from its large, rough, and widely-spreading leaves and stems; while it can boast of little beauty in its single yellow pea-flowers. It will grow in any soil or situation.

Haulm.—The dead stalks and leaves of peas, potatoes, &c. It is generally gathered up, and carried to the rubbish-heap to rot for manure, or burnt. It is also sometimes used for covering the ground over the roots of trees, &c. to keep out the frost.

Hawkweed.—The plants properly called Hawkweed belong to the genus *Hieràcium;* they have generally yellow flowers, and many of them are British weeds: the yellow Hawkweed of the gardens (*Tólpis barbàtus*), and the red Hawkweed (*Borkhausia rùbra*), are, however, quite distinct. They are both hardy annuals, which only require sowing in the open border; and one of which (the yellow) will stand the winter in the open ground without protection, if sown in autumn. The red-flowered kind is very apt to become drawn up with long slender stems, and requires staking and tying to make it look well.—See **Crepis** and **Hiera'ci'um.**

Hawthorn.—*Cratæ̀gus Oxyacántha.*—See **Cratægus.**

Hazel.—*Córylus Avellàna.*—The common Hazel is rather a fruit-tree than an ornamental shrub; but it is sometimes grown in pleasure-grounds and geometric gardens, to form a shady walk. Walks of this kind were great favourites in the time of Elizabeth, and also in the Dutch gardens laid out in the time of William III. They are therefore suitable in the gardens of Elizabethan houses, or of any mansions built in James I.'s style. They require no particular care but planting the young trees in a loamy soil, giving them, if possible, a little of that rich yellow soil generally called hazel-loam, from its peculiar adaptation to this plant, and clipping and training the branches so as to make the walk form one continued bower.

Heart's-ease.—Most of the different kinds now in cultivation have sprung partly from the wild kind, *Viòla trìcolor,* hybridized by some other species; and as all the kinds, whether hybrids or species, vary very much when raised from seed, and as these varieties and hybrids may be readily cross-bred with each other, the number of kinds that may be raised defies all calculation. The heart's-ease must be grown in very rich soil, composed, if in pots or boxes, of four parts of rich loam, one of sand, and one of decayed leaves or rotten dung; and if in the open ground, of rich loam highly manured. It is propagated by seeds, or division of the root. The seeds should be sown as soon as they are ripe in a bed, where the young plants should remain till they flower, when the best should be taken up and replanted in another bed, or in well-drained pots or boxes, for flowering. The plants will require constant watering during the hot weather; but they are very apt to damp off if the soil in which they grow has not been well drained. The best varieties are propagated by cuttings taken off from the points of the shoots, in the spring, cutting them clean across immediately below a joint. The cuttings should be struck in pure white sand, and covered with a bell-glass; they should not be watered when put in, and they should be shaded for several days. Heart's-eases are also propagated by layers, pegged down at a joint, but not slit, on account of their tendency to damp off.

Heat is concentrated or produced in gardens in a variety of ways: by shelter from winds, which prevents the natural heat of the plants from being carried off by currents of air passing over them; by exposure to the sun, which concentrates its rays; by covering a surface of soil, or the roots and stems of plants with a non-conducting material, such as straw, litter, leaves, &c. which prevents its radiation; by fermenting substances, such as stable-dung, litter, leaves, tan, &c., which produce heat by their decomposition; and by the consumption of fuel, from which the heated air generated, is conducted in flues, or by means of pipes of hot water or steam. Hot-beds are generally heated by a bed of horse-dung, or other fermenting material; and brick-built pits, or houses with glass roofs, are heated by furnaces and flues, or furnaces, boilers, and pipes of hot water or steam. Stable-dung and hot-water-pipes are the two best modes of heating pits and glass-roofed houses. Heat when produced is retained by coverings which admit the light, such as glass sashes, or in some cases frames covered with oil-paper, or with very thin canvas or gauze.

Heath.—See **Erica.**

He'dera.—*Araliaceæ.*—The Ivy. This well-known plant is what botanists call a rooting climber; that is to say, its stems climb up and twine themselves round trees, or any other suitable object which presents a sufficiently rough surface for their roots to take hold of; as, unless this is the case, the ivy, whenever it is rendered heavy by rain or snow, falls down. Whenever, therefore, ivy is wanted to cover smooth, newly-plastered walls, trellis-work should be fixed against them, to which the ivy should be nailed like any other plant. The ivy is remarkable for undergoing a complete change in its leaves when it flowers. The barren or creeping ivy, which trails along the ground, and roots into it, rarely flowers, and its leaf is deeply cut; but the tree ivy, or flowering part, rears itself on high, so as to be fully exposed to the light and air, and the leaves become of an oval shape. *H. canariénsis*, the giant, or Irish ivy, as it is sometimes called, though it is a native of the Canaries, is hardier and grows much faster than the common kind; but the variegated kinds are more tender, and grow much slower. Ivy requires a deep and somewhat light soil, into which its roots can penetrate easily; and when grown for any purpose in pots or boxes, it should be abundantly supplied with water. Ivy is useful in all cases where a naked space is to be covered with green in a short space of time; and it is particularly valuable in town gardens, as it will bear the smoke and want of pure air in cities better than most other plants. It should, however, in all close and crowded situations, be abundantly supplied with water, and occasionally syringed over the leaves. The gold and silver varieties are very beautiful, especially the former, when grown against the chimney of a dwelling-house or hothouse; but they require warmth to make them thrive.

Hedgehogs.—*Medicago minima.*—An annual plant, with small yellow pea-flowers, and curiously shaped capsules, which resemble hedgehogs. The plant is weedy-looking, and not worth growing.

HEDGE MUSTARD.—See ER'YSIMUM.

HEDGE NETTLE.—See STACHYS.

HEDGES for flower-gardens should be composed of ornamental plants, such as *Cydònia japónica*, privet, laurestinus, *Rìbes sanguínum*, roses, and double-blossomed furze, or ivy and other climbers, trained over iron trellis-work. The hedge to a flower-garden should never be stiff and formal, so as to look like a mere barrier; but it should be so arranged, and should consist of plants which harmonize so well with the flowers in the garden, as to make them appear a part of it. For farther details on this subject see FENCES.

HEDY'CHIUM. — *Scitamineæ.* — Large reed-looking plants with splendid flowers, but which are only suitable for large places, as they require the heat of a stove, and a great deal of room, to make them flower well. They are natives of the East Indies. *H. coronarium*, which is one of the commonest kinds, has large white flowers, which are exceedingly fragrant. All the kinds require a light rich soil, and are increased by dividing at the roots.

HEDY'SARUM. — *Leguminosæ.* — The French Honeysuckle. The species are mostly hardy biennials and perennials, which require only the usual treatment of their respective kinds. They will grow well in any rich light soil, and they are increased by division of their roots and by seeds.

HELE'NIUM. — *Compositæ.* — The species are generally tall-growing perennial plants, with large yellow flowers. They are increased by dividing the root. There are two or three annual species which are quite hardy, and only require sowing in the open border. The handsomest of these is *H. quadridentum*, which has bright orange-coloured flowers, like a Rudbéckia.

HELIA'NTHEMUM—*Cistaceæ.*—The Sun-rose. Low shrubs, generally used for planting on rockwork, and strongly resembling the Cistus or Rock-rose. As most of the species are rather tender, they require protection during winter. For this reason, they are either grown in pots, which are placed on the rockwork among the stones; or taken up and repotted in winter, to be planted out again in spring. The soil should be a compost of loam and peat. They are generally increased by seeds, which they ripen in abundance.

HELIA'NTHUS.—*Compositæ.*—The Sunflower. The annual plant of this name, though a native of Peru, is of the hardiest of its kind, as it only requires sowing in the open border in any common garden soil. It is not, however, suitable for any situation, unless there be abundance of room, on account of the large size of its stalks and leaves. The perennial kinds are much smaller, and very ornamental: they are quite hardy, and will grow in any soil and situation.

HELICHRY'SUM. — *Compositæ.* — The Everlasting. The common yellow everlasting, *H. bracteàtum*, is a hardy annual that only requires sowing in the open border; *H. bìcolor* is a very slight variety, merely differing in having the outer petals tipped with copper colour; but *H. macrànthum* has white flowers tipped with pink, and is very handsome. This species is a native of the Swan River colony, and it should be grown in a light peaty soil. It may either be sown in the open ground in April, to flower in autumn, or in a hot-bed in February, to plant out in May.

HELICO'NIA.—*Musaceæ.*—Splendid hothouse plants, which require a rich sandy loam, and plenty of room and heat, to bring them to perfection. They are propagated by division of the root.

Helio'phila.—*Cruciferæ.*—Beautiful little annual plants, natives of the Cape of Good Hope, generally with blue flowers, and very long slender stems. The seeds should be sown on a hot-bed in February, and the plants planted out in a warm open situation in May.

Heliotrope.—See Heliotropium.

Heliotro'pium. —*Boragineæ.* — The Heliotrope is a favourite flower in most countries, from its fragrance, which, however, is overpowering, and very unpleasant to those not accustomed to strong perfumes. It should be grown in a light rich soil; and though it requires protection during winter, it may be planted out in May, when it will flower splendidly in the open air, till destroyed by frost in autumn. It is propagated by cuttings, which strike easily.

Helix.—The Snail. Snails are so destructive to gardens, and particularly to those of small size, that too much care cannot be taken to destroy them. The best time for effecting this is in winter or early spring, when the snails are in a quiescent state, and when they will be found in great numbers sticking to the walls, under ivy, &c., in box-edgings, or in the crevices of rockwork, &c. In spring, the warmth and moisture induce them to leave their hiding-places, and they commence their work of destruction. At this season, they should be sought for in the day-time, in the same kind of places as those they select for their winter retreats, and if possible destroyed before they lay their eggs, which they do in April or May. The eggs, which are buried in the earth in some rather moist and shady place, and which are whitish, and quite round and transparent, should be sought for and destroyed in May or June. By these means the ravages of snails may be in a great measure prevented; and there will be no occasion to resort to watering the beds with lime or tobacco-water, remedies which, unless very judiciously practised, are in fact worse than the disease. Many persons place empty flower-pots in different parts of a garden infested with snails at night; and when this is done, a great number of snails will generally be found either in the pots or sticking to the outside in the morning. Cabbage-leaves and slices of raw potatoes are also laid as traps for snails.

Helle'borus.— *Ranunculaceæ.*— The Christmas Rose, *H. nìger*, is one of the handsomest plants belonging to this genus, on account of its flowering in winter, or very early spring, before almost every other flower. It is a hardy perennial, which will thrive in any common garden soil, and is increased by dividing the roots.

Helmet-flower. — See Corya'nthus.

Helo'nias.—*Melanthaceæ.*—Perennial plants, natives of North America, which produce spikes of very small pinkish or white flowers, and which are generally grown in peat soil, and in a moist situation. They are propagated by seeds or division of the root.

Hemeroca'llis.—The Day Lily.—Handsome perennial plants, with yellow or copper-coloured flowers. They are quite hardy, and only require a moist soil and a shady situation. They are propagated by dividing the roots. For the white and purplish flowered kinds, see Funkia.

Hen and Chickens.—A kind of daisy.—See Bellis.

Henbane.—See Hyoscyamus.

Hepa'tica. — *Ranunculaceæ.*— Pretty little plants, which flower very early in spring. They should be grown in a light sandy soil, and a shady situation; and, as they have a propensity to raise themselves out of the soil, they should be taken up every two or three years in autumn, and replanted. If this be not done, the earth should be raked or hoed up round them, so as to cover the roots, as if these are left exposed, they will wither, and the plants will probably die. The flowers of the *Hepatica*, unlike those of most other plants, possess their full colour from the first formation of the bud.

Heracle'um. — *Umbelliferæ.* — The Cow-parsnip. The gigantic Siberian cow-parsnips, *H. asperum*, and *H. giganteum*, are probably two of the most magnificent herbaceous plants in the world. They are biennials, and are propagated by seeds, which ripen in abundance. The plants should be placed in a shady, moist situation, near a pond, if possible; and where this is not practicable, they should have abundance of water. Thus treated, a plant has been known to attain the height of fourteen feet in a single summer, with a fluted stem six or eight inches in diameter; and a compound umbel of white flowers, measuring twelve feet in circumference. A plant of these dimensions, with leaves equally enormous, grew in the grounds at Bromley Hill in the summer of 1839; and another of nearly the same size grew in our small garden at Bayswater in the summer of 1840.

Herbe'rtia.—*Irideæ.*— A beautiful bulbous plant named in honour of the Reverend and Honourable William Herbert, whose botanical labours are so well known. It is a native of Buenos Ayres, and it may be grown either in a pot, or in the open air, in a sandy loam, as it only requires protection from severe frost or long-continued rains.

Herb-Robert. —A kind of wild geranium, very common by the road-sides throughout England and the north of France.

Hermione'.—A name given by Mr. Haworth to one of the genera which he formed out of the genus Narcissus.

Heron's Bill.—See Erodium.

Hespera'ntha. — *Irideæ.* — The Evening Flower. A genus of Cape bulbs, nearly allied to Ixia, and requiring the same treatment.

He'speris. — *Cruciferæ.* — The Garden Rocket. These flowers, though very common, are rarely well-grown, as they require a great deal of care to bring them to perfection. They are all perennials; and as soon as they have done flowering, they should be taken up, and transplanted into fresh, and very rich soil, which must be of a light and friable nature. The best is, perhaps, that which has been used during the preceding summer for celery trenches. Thus treated, the double white and double purple varieties of *Hésperis matronàlis* will attain extraordinary size, and will flower splendidly.

Hibbe'rtia. — *Dilleniaceæ.* — Trailing shrubs with large yellow flowers, natives of New Holland, which require a greenhouse in England. They should be grown in a mixture of sandy loam and peat, and they are propagated by cuttings.

Hibi'scus. — *Malvaceæ.*— Showy plants with large handsome flowers. The hothouse species, which are mostly from China, require a strong moist heat. *Hibiscus syriacus*, the *Althæa frutex*, is a hardy shrub, which will grow well in any common garden soil, and of which there are numerous splendid varieties, some of the best of which are those raised by Mr. Masters, of Canterbury. The *Althæa frutex* is propagated by seeds or layers. Several of the different kinds of *Hibiscus* are marsh plants, which grow best in pots suspended in water from the side of a pond. See Water-plants.

Hiera'cium. — *Compositæ.* — The common Hawkweed. British plants, with large yellow flowers, which will grow freely in any light rich soil. They are propagated by seed, or division of the roots. The name is said to be derived from the juice of these plants being formerly given to hawks, to clear and improve their sight; and it is still used for bathing the eyes in ophthalmic disorders.

Hip.—The fruit of the wild rose.

Hippea′strum.—A genus now included in Amaryllis.

Hippocre`pis. — *Leguminosæ.* — The Horse-shoe Vetch. The most common species in gardens is a greenhouse plant, with yellow flowers, a native of Minorca, which should be grown in a light sandy soil, and is propagated by seeds or cuttings.

Hippo′mane. — *Euphorbiaceæ.* — The Manchineel tree. This is so poisonous a plant, that it is dangerous to prune it without gloves; and it is said to occasion the death of those who sleep beneath its shade. It is a native of the West Indies, and requires to be grown in a hothouse, in sandy loam, in England. It is propagated by cuttings, which should be stuck in pure sand under a hand-glass.

Hippo′phæa.—*Elæagnaceæ.*—Sea Buckthorn. Handsome hardy shrubs, natives of North America, which will grow in any common soil, and are increased by layers.

Hippu`ris.—*Halorageæ.*—Mare's-tail. A British aquatic; sometimes planted in ponds, &c. to hide their termination, and to give the water the appearance of a natural stream.

Hoa`rea.—*Geraniaceæ.*—A genus including all the tuberous-rooted geraniums, and named after Sir Richard Colt Hoare, who was very fond of cultivating these plants. See **Geraniums.**

Hoe. — There are many different kinds of hoes; but they may be all reduced to two classes: the draw-hoes, which have broad blades, and are used for drawing up the earth to the roots of plants, being pulled to the operator; and the thrust or Dutch hoes, which are principally used for loosening the ground and destroying the weeds, and which the operator pushes from him.

Hoeing is an operation used for loosening the earth, and destroying weeds, where both digging and forking would be injurious to the roots of the plants forming the crop. It is also used to draw the earth up to those plants which send out numerous fibrous roots close to the surface of the ground. This last operation is called hoeing up, and it is generally practised with annual culinary crops.

Ho′lcus.—A kind of grass.

Holly.—See **Ilex.**

Hollyhock.—See **Althæa.**

Homeria. — *Irideæ.* — A genus of Cape bulbs, formerly included in Moræa, and which may be grown in the open air, if protected by a hand-glass during severe frosts or heavy rains. The soil should be a sandy yellow loam; and the plants are propagated by offsets, which should be taken off and replanted in September or October.

Honesty.—See **Lunaria.**

Honey Dew is a clammy substance often found on the leaves of trees and shrubs in hot weather; and it is by some supposed to be produced by insects, and by others to be exuded by the tree. Whatever may be its cause, it does injury by stopping up the pores of the leaves; and it should be washed off as soon as it is discovered.

Honey-flower.—See **Melianthus.**

Honeysuckle. — See **Caprifolium** and **Lonicera.**

Honeywort.—See **Cerinthe.**

Hoop-petticoat.—A kind of Narcissus, *N. bulbocodium.*

Hop.—See **Humulus.**

Horn of Plenty.—See **Fedia.**

Horn-poppy.—See **Glaucium.**

Horns.—See **Fedia.**

Horse-shoe Vetch.—See Hippocre'pis.

Hotbeds are formed of dung, or any other vegetable fermenting material; but stable dung is in most general use, and is by far the best. When newly brought from the stables, it should be laid in a heap or ridge, five feet or six feet in width, and four feet or five feet in height; and after lying three or four days, till a brisk fermentation has taken place, it should be turned over, taking care to place what was outside in the interior; and after a few days more, when a second fermentation has taken place, and the straw has become so tender as to be easily torn asunder with a fork, the dung may be made up into a bed. This bed should be formed on a platform of soil, six or eight inches above the general surface, to preserve it from wet; and it should be of such a length and breadth as suits the frame or bottomless box which is to be placed upon it. For raising tender annuals, or striking cuttings, the depth of the bed of dung need not be more than two feet, if it be early in the season, for example in February; but if the bed be not prepared till April, it need not be made above one foot in thickness. When the bed is formed, the upper surface should be perfectly level, or slightly sloping to the south; and it should be three or four inches wider than the frame on every side. After the frame is set, the surface of the bed may be covered with six inches of light soil, on which the seeds may be sown; or, what will generally be found preferable, the seeds may be sown in pots, and plunged in this soil, care being taken that the heat of the bed is not too great, and that the seedlings when they come up do not suffer for want of air. There are thermometers for trying the temperature of earth or dung by plunging them into it; and there are others for trying the temperature of the air; but a very little experience will render these unnecessary. The soil should not be warmer than 60°, nor the air than 65° or 70°, even during bright sunshine; but if during the night it falls as low as 45° or 50°, no bad consequences will ensue. In severe weather, the sashes may be protected at night with mats, boards, canvas, or hurdles, covered with thatch or reeds. Hotbeds should always be placed in a sheltered situation open to the south, and if possible on dry soil. When the heat of the dung begins to fall low, it may be renewed by exterior linings, which are narrow masses of fermenting dung placed round the main bed of dung: but for raising flower-seeds, this is seldom necessary.

Hothouses differ from greenhouses in being kept at a higher temperature, so as to suit tropical plants; and in having a flat bed for the principal part of the plants to stand on, instead of a sloping stage of shelves. This bed is commonly surrounded by a narrow brick wall, two or three feet high, and filled with tan in which the plants are plunged; but in some cases, instead of tan, or any other fermenting material, there is a cavity beneath the bed, in which flues or pipes of hot water are placed; and the surface of the bed is either covered with sand, or some other material, calculated to retain an equality of moisture, in which the pots are plunged in the same manner as in the tan. Some cultivators do not use any materials in which to plunge the pots, but merely set them on the surface of the bed, trusting to the general heat of the air of the house, or the heat emitted through the bottom of the pit from the pipes or flues below, taking care to keep the surface of the bed on which the pots stand moist by pouring water over it at least once a day. The heat of hothouses for ordinary tropical plants should at no period of the day or year be lower than 65°; but in summer, during bright sunshine, it may be as high as 70°, 80°, or 90°. During winter it should never be lower than 60° in the day-time. In hothouses devoted to the growth of Orchideous plants, a higher temperature is requisite than for the ordinary plants of the tropics, and also a proportionately great degree of moisture; and in order to attain the latter object, the floor of the house, or the hot-water pipe, should be frequently sprinkled with water. Such houses, from their intense heat, are commonly unpleasant to remain in for any length of time; but this inconvenience is avoided by producing a free circulation of the air, which, when in motion, even though the temperature is 70° or 80°, is by no means more inconvenient than that of a greenhouse with the air at 60°, and at rest. This motion is produced by having the heating pipes in a flue or tunnel at the back of the house, or indeed in any part of it, and conducting large air-tubes from this flue or tunnel to the highest part of the house. From the opening of the tubes the heated air is emitted and diffused through the house; while underneath the floor there are horizontal tunnels communicating with the tunnel containing the hot-water pipes, with gratings over them at their farther extremities, by which gratings the air of the house is drawn in, to be reheated by the hot-water pipes, and re-emitted by the upper extremities of the tubes which proceed from them. This mode of heating is the invention of Mr. Penn, of Lewisham.

HOTTO'NIA.—*Primulàceæ.*—The Feather Foil, or Water-violet. An aquatic British plant, which produces a pretty effect from its pink flowers, on the borders of ponds and ditches, where the soil is gravelly.

HOUND'S TONGUE. — See *CYNOGLO'SSUM.*

HOUSE LEEK.—See SEMPERVIVUM.

HOUSTO'NIA.—*Gentianeæ.*—Pretty little plants, natives of North America, and suitable for rockwork. They should be grown in peat soil kept moist, and they are propagated by dividing the roots.

HO'VEA.—*Leguminòsæ.*—Beautiful dwarf shrubs, natives of Australia, which require a greenhouse in Great Britain. They should be grown in a mixture of sandy loam and peat; and they may be propagated by cuttings, which are rather difficult to strike; and which should therefore be put under a bell-glass, in pure sand, and plunged into a hotbed.

HO'YA. —*Asclepiadaceæ.* — The most common species, *H. carnòsa*, has curious wax-like flowers, from which drops a sweet, honey-like juice. It is a hothouse climber, which requires a light rich soil, and is propagated by cuttings, which, however, will not strike without the help of bottom-heat. It is sometimes grown in greenhouses, if in a warm situation, exposed to the sun. In this case, it should be trained close to the glass, and a mat, or some other covering, thrown over the roof of the house in severe weather.

HUDSO'NIA. — *Cistineæ.* — North American heath-like shrubs, nearly allied to the Helianthemums, which require protection in England during winter. They should be grown in peat, and they are propagated by cuttings struck in sand.

HU'MEA.— *Compositæ.* — Elegant biennial plants, which should be sown on a slight hotbed in spring; then potted off and kept in the open air during summer, and in the greenhouse during winter, to be finally planted in the open border in May the second year. If the plants are re-potted three or four times during the course of the first summer, always into only a little larger pots, they will become so much stronger before they are finally planted out, as amply to repay the additional trouble.

HU'MULUS. — *Urticàceæ.* — The Hop. This plant, though generally grown for the purpose of making beer, is a very ornamental climber, and very suitable for covering bowers, &c. from the great rapidity of its growth, and the deep shade afforded by its large and numerous leaves. It should be grown in a rich and deep loamy soil, and it is increased by dividing its roots.

HYACINTH.—See HYACINTHUS.

HYACI'NTHUS.—*Asphodeleæ.*—The common garden Hyacinth, *Hyacinthus orientàlis*, is one of the most beautiful as well as the most fragrant of flowers; and to a certain extent it is also one of the easiest of culture for the amateur gardener. The reason of this is, that the bulbs are generally to be purchased at an easy rate in the seed-shops, and the leaves and flowers being prepared in the bulb during the previous year, it is only necessary to place the bulbs in soil of any kind, or even on the surface of vessels of water, to produce a very fine flower. But this will not insure a bloom in the following year, because that depends not only on the plant being placed in circumstances where it will flower freely, but also where it will produce abundance of healthy leaves, and bring these to maturity. This is only to be done in beds properly prepared for the purpose, and under a proper system of management. We shall first speak of the most common mode of growing Hyacinths, viz.—in miscellaneous borders; next, of the most perfect mode of growing them,—viz. in beds of properly prepared soil; and, lastly, of growing them in glasses of water.

Growing Hyacinths in miscellaneous borders, among other flowers.—Fix on the spots where they are to be planted, and loosen the earth to the depth of a foot with the spade, breaking it fine, and taking care that the roots of the adjoining plants are cut off, so as not to interfere with those of the Hyacinths. Remove three or four inches of the soil, and then deposit three or four bulbs, one in the centre and the others round it, so as to form a centre not more than six inches in diameter. Press the roots firmly into the soil, and cover them, three or four inches deep, with the soil, if it is a common garden loam, and five or six inches if it is a light sand. Plant only roots of one colour together, and put in a stick to mark the spot, that they may not be interfered with before they come up, when the bed is being dug over in spring. The season for planting Hyacinths is October or November; but even December is not too late in mild seasons, and in favourable situations. In general, no protection from frost is requisite; for the Hyacinth is very hardy, and chiefly suffers from too much water, from snails, or from a disease called the canker. In heavy clayey soils, a small cone of soil may be raised over the roots to throw off the rain; but when this is done, the cone ought to be levelled down in February, before the plants come up; or a small gutter may be formed round each circle of bulbs, to drain off the wet. Where borders have a sloping surface, both these precautions are unnecessary; and hence, in the garden of the Zoological Society in the Regent's Park, Hyacinths are planted in the sloping borders, though the soil is a strong clay, in autumn, and flower vigorously every spring. Hyacinths thus treated will produce very fine flowers the first spring; and, even though not taken up, if they are not injured by canker, or slugs, or the roots of adjoining plants during summer, they will flower tolerably well the second, and even sometimes the third year;

after which their flowers will become every year weaker and weaker, till at last the plants are not worth the room they take up in the border. If it is wished to preserve the roots in a vigorous state, they ought to be taken up after flowering when the leaves have faded, and kept in a dry airy shed, with the neck of the bulb turned down; and then planted in a properly prepared bed in autumn, where, after remaining two years, they will have recovered their vigour, and be fit to plant again in the border. Planting Hyacinths in miscellaneous borders is the most convenient mode for amateurs, and in general it produces the most agreeable effect in a private garden, for beds of Hyacinths have more the appearance of being cultivated for sale by a florist, though it must be confessed that stronger flowers are produced in this way, and the effect, considered by itself, is far more splendid.

Beds of Hyacinths.—The most convenient width is five feet; and the length may be greater or less, at pleasure. Five feet in width will admit of four rows for the four colours of red, white, blue, and yellow; which should be six inches apart between the rows, and the bulbs may be placed at the same distance from each other in the row. The arrangement of the colours may be according to fancy, but the common mode is never to have two of a colour together. To prepare the bed, dig out the soil to the depth of three feet, and fill it up to one foot above the surface with very sandy loam mixed with leaf mould, cow-dung, or hotbed dung, thoroughly rotten. This may be done in September; and in October six inches of the soil may be removed, and the bulbs planted; after which the soil must be replaced. To protect the bulbs from too much wet during the winter, the surface of the bed should be gently sloped to each side; and during rainy weather it may be covered with reeds or thatch, in such a manner as to throw off the rain. Thus treated, the plants will bloom with great vigour; and to have the colours in the greater perfection, the bed ought to be covered in the flowering season with a tent or awning. But for amateurs the most convenient mode is, to form the bed of such a size as to be contained either in a common cucumber-frame with glass sashes, which may be put on during heavy rains, and also during sunshine; tilting them at both ends to admit a free circulation of air, and covering the glass with mats to exclude the sun. Care must be taken to remove the glasses entirely during cloudy weather, in order not to draw up the plants; and, for the same reason, to take them off every night when the weather is dry. A common cucumber-frame, of twelve feet long and four feet wide, will contain a very handsome collection of Hyacinths; which may thus be grown to the highest degree of perfection, and protected from every exterior injury. As soon as the plants have done flowering, the frame and glasses may be removed; and when the leaves have become yellowish, the bulbs may be taken up, and each kind kept by itself, and placed in an airy situation in the shade till they are quite dry. After this they should be cleansed from any soil that may stick to them, and the fibrous roots, which will have withered up, should be rubbed off. The bulbs should then be laid on a shelf of lattice-work with the neck of the bulb downwards, or placed in shallow wicket baskets, and hung up in an airy shed or room till wanted for use. If decay or canker make their appearance, the parts injured, if small, should be cut out and the bulb laid aside to dry; but if the parts injured extend far, the bulb should be thrown away at once; as the disease is infectious, and will communicate itself to healthy bulbs lying near the diseased ones. Hyacinth bulbs are generally fit for putting in baskets in the course of the month of July, and the bed being partially renewed with fresh soil, they may be planted again in September or October. A third part of the soil being taken away, and replaced by fresh soil every year, the bed may continue to be used for an unlimited period. Young bulbs or offsets will be produced more or less every season, and these may be taken off when the bulbs are raised, laid by themselves, and planted in a nursery-bed for a year; when they will have grown sufficiently large to be fit for planting in the flowering bed. Single-flowered Hyacinths, whether in mixed borders or in beds, will generally have a tendency to produce seeds; but as these weaken the bulbs, the flower-stalks should be cut off as soon as the flowers have faded, or the capsules ought to be stripped off the flower-stalk with the hand as soon as they appear; unless, indeed, it is wished to raise new sorts, —in which case the seeds may be allowed to ripen, and they should be sown under glass as soon as they are ripe. They will come up the following spring, and, if carefully transplanted and properly treated, will produce flowers in from three to five years.

Flowering Hyacinths in glasses of water is a very simple operation, and may be effected by filling the glass with water up to the neck; and then placing the bulb in the cup-shaped part of the glass intended to receive it, and renewing the water from time to time when it begins to get muddy. When the water is changed the bulb should not be taken out, unless the roots are short and few, but the hand should be put over the top of the glass so as to retain the bulb in its place, and the water carefully and slowly poured off. This is done to prevent any injury being done to the long roots, as they are very brittle and easily broken, and the plant is seriously injured by their being in an imperfect state. When one of the long roots is broken, it should be cut off with a sharp knife close to the bulb.

To grow Hyacinths in water-glasses to the greatest perfection, it is advisable first to plant the bulbs in soil, and when they have made roots of an inch or more in length, to take them up, wash the roots, and place the bulb in the glass. The use of previously planting the bulb in the soil is to cause it to throw out roots more freely; the stimulus of the moist earth being found more effective for this purpose than moisture alone. When the bulbs are put into the water, without previously planting them in the ground, the glasses may be kept for a few days in the dark, till the roots begin to grow; but as soon as this is the case, the glasses should be placed in a warm room near the light, when the plants will grow rapidly. Should the flower-stems appear weak, they may be supported by a slender prop fixed in a disk of wood, on which the glass may be placed as its base; or by any other elegant or convenient means. In choosing Hyacinths for water-glasses, the red and blue flowers are preferable to those which are white or yellow; the latter two having a fragrance too powerful for rooms, and, besides, they generally flower weaker in glasses than the others. In the windows of seed-shops we sometimes see Hyacinths or Narcissi with their flowers inverted in a glass of water, appearing as if they had grown in that position. They are, however, grown in the usual manner, with the glass inverted over the pot in which the flower is grown, and only turned and the glass filled up with water after the flower has expanded, the flower-pot being removed, and the bulb wrapped in wet moss. Sometimes another flower appears growing from the other end of the glass; but this is grown in another flower-pot in the usual way, and only removed to the glass when it is wanted to produce the proper effect. Deceptions of this kind cannot be considered in good taste, particularly at the present day, when people are so much better educated than formerly. Hyacinths flowered in water are seldom good for much afterwards; nevertheless, if the leaves are carefully preserved, and the plants, immediately that they have done flowering, are planted in a nursery-bed, they will recover their vigour in two or three years. It is also said that sinking the bulb entirely in water after it has done flowering invigorates it, and will enable it to flower the second year; but I have never had an opportunity of proving this. A very small portion of common salt added to the water has been found to accelerate the growth of Hyacinths, and give a deeper green to their leaves; and keeping the water warm, say at a temperature of 60°, also accelerates their growth. It must, however, be remembered, that too much salt will kill the plants.

Growing Hyacinths in pots of soil requires no particular care. To insure a vigorous growth, the pots ought to be deeper than usual, and they need not be much wider at the top than at the bottom. The soil ought to be a sandy loam, mixed with rotten leaves or dung so thoroughly decayed as to have become a kind of mould, and the pots ought to be well drained. When first planted, which ought to be in September, or any period between that month and February, the bulbs may be kept in a cool place, and covered with soil or rotten tan, till the buds have begun *to move;* when the pots may be taken to the greenhouse or the windows of a warm room, and if the soil be watered with warm water they will grow so much the faster. When the plants have done flowering, they may be turned out of the pots with the balls of earth unbroken, into the common soil; and the bulbs may be taken up and dried when the leaves have decayed. Bulbs which have flowered in pots seldom flower vigorously the second year; and unless the amateur has abundance of room for a nursing-bed, and leisure to manage it, it is better to throw away at once bulbs which have been flowered either in pots or in water-glasses.

HYDRA'NGEA. — *Saxifrageæ.* — There are several kinds of Hydrangea, most of which are American shrubs, which are quite hardy in British gardens. The kind best known, however, and which is called the Hydrangea, *par excellence*, is a Chinese shrub, which is only half-hardy in England. Botanists call it *Hydrangea Hortensia*, the specific name being given in honour of a French lady, whose Christian name was Hortense; and though it is now so common, it has not been introduced much more than fifty years; the first plant of it grown in Britain having been imported from China by Sir Joseph Banks, in 1789 or 1790, about the same time as the tree Peony. The Hydrangea, though nearly hardy, is generally considered as a greenhouse or window plant; and it is admirably adapted for the latter situation, as it is scarcely possible to give it too much water, though water may be withheld from it for several days without killing it—the plant reminding its possessor of its wants by its conspicuously drooping leaves, and reviving rapidly when water is given. It should be grown in a rich soil, and its branches should be cut in every year when it has done flowering; as, otherwise, the branches are apt to become unsightly from losing their leaves near the base.

Blue Hydrangeas are very much admired, partly, perhaps, from the difficulty of obtaining them, for no plants can be more capricious. Sometimes they come without any trouble at all; sometimes applying any one of the numerous recipes recommended will change the colour, either directly or gradually; and sometimes no care, and no recipe has the slightest effect, and the flowers remain pink in spite of all that can be done to turn them blue. Water impregnated with alum, steel-filings, sheep's dung, wood-ashes, peat-ashes, nitre, carbonate of soda, or common salt, are all recommended, and all succeed—sometimes. The flowers are sometimes turned blue by removing the plants to a loamy soil, and sometimes by planting them in peat. It is generally allowed that the fine yellow loam found in some parts of Hampstead and Stanmore Heaths, and the peat of Wimbledon Common, are sure to produce the desired effect; as is also the peat of the bogs near Edinburgh, and that of the neighbourhood of Berlin and St. Petersburgh; but these soils are not always to be procured when wanted. Water in which tan has been steeped is also very often successful; though, like the other recipes, it cannot always be depended on.

HYDRO'CHARIS.—*Hydrocharìdeæ.* Frogbit. A pretty little British water-plant, with white flowers.

HYDRA'STIS. — *Ranunculàceæ.*— Yellow root. A tuberous rooted North American plant, which requires a rich moist soil, and is increased by dividing the root.

HYDROPE'LTIS. — *Hydropeltìdeæ.* —A North American water-plant, with large round pinkish leaves, and small purplish flowers. Like the Water Lily, this plant closes its petals at night, and sinks below the surface of the water, to rise and open again the next morning.

HYDROPHY'LLUM. — *Hydrophýlleæ.*—Water Leaf. So called because the leaves curl up so as to hold water. The plant is a hardy perennial, which will grow in any light soil, and which is easily increased by suckers from the roots.

HYDROPI'PER.—Water Pepper. See POLYGONUM.

HYOSCY'AMUS. — *Solanàceæ.* — Henbane. The annual kinds are quite hardy and will grow anywhere, but they prefer a soil that is rich and light. The English kinds are generally found on old dunghills, or heaps of mould from decayed vegetables. The perennials also prefer a light and rich, and yet deep soil; and they are increased by dividing the roots.

HYPE'RICUM—*Hypericaceæ.*—St. John's Wort. The pretty yellow-flowered shrubs and herbaceous perennials known by this name at the present day, were formerly in high repute for driving away evil spirits; and on this account were generally planted near dwelling-houses. They were also highly valued for their medicinal properties, being believed to have a powerful effect in stopping blood and healing wounds. The most common kind, the Tutsan, or Park Leaves, is now made into another genus, under the name of Androsænum; but the botanical distinction is very trifling. All the kinds will thrive under the drip of trees; and they will grow in any soil and situation, though they prefer moisture and the shade. They are found in almost all the temperate climates of the world; and they are propagated by seeds, and by dividing the roots.

I.

Iberis.—*Cruciferæ.*—Candytuft. Most of the kinds of Candytuft are well-known annuals, which received their name from *I. umbellàta*, the first species grown as a garden flower, having been brought from Candia. The seeds should be sown in a rich light soil in autumn, where they are to remain, and kept rather dry during winter. They should be repeatedly thinned out, and in spring they should be watered with liquid manure, taking care not to let the liquor touch the plants. When the plants are about to flower, those of the common kind should be six or eight inches apart every way at least; and those of *I. coronària*, the Rocket Candytuft, should be from one to two feet apart; and thus treated, the flowers will be very large and fine. When it is not thought advisable to take so much trouble, the seeds may be sown very thin, either in autumn or early in spring; either alone, or mixed with mignonette; and in either case they will look very well in the flower borders. The perennial and suffruticose kinds are well adapted for rock-work; and they are easily propagated by cuttings, or dividing the root.

Iceland Moss. —*Cetràrià Islándica.*

Ice Plant. See Mesembryanthemum.

Ichneumon Fly.—A very elegant slender creature, somewhat resembling a gnat, which generally deposits its eggs in the living body of a caterpillar. Great numbers of caterpillars are thus destroyed every year; and as the grub of the Ichneumon does not feed upon vegetable matter of any kind, it may thus be regarded as a friend to gardeners, and it should be spared accordingly. Sometimes a *single fly* will lay from thirty to forty eggs. Whenever a number of small white grubs are observed to appear on the body of a caterpillar, or a number of little masses of what looks like fine yellow silk, the caterpillar should not be crushed; as it is serving as a nursery for Ichneumons, by which dozens of other caterpillars will be destroyed.

Ilex.—This name is frequently applied in common conversation to the *Quércus Ilex*, or evergreen oak; but it is properly the botanic name of the Holly.

Ilex. — *Aquifoliàcea.* — A genus of evergreen shrubs or low trees, of which the most interesting is *Ilex Aquifòlium*, or the common Holly, a native of Britain, with fine dark green prickly leaves, and scarlet or coral-coloured berries. There are a great many varieties of this shrub, some of which have leaves variegated with cream colour, white, different shades of yellow, and slight tinges of red; and others have white, yellow, and even black fruit. They are all beautiful, and, being evergreen and quite hardy, are reckoned among the most ornamental of British shrubs. They grow slowly, but, as they are always erect and compact, they are very valuable for small gardens, where the plants require to be kept within bounds. The species are propagated by seeds, which are kept a winter in the rot-heap (see Rot Heap) before they are sown; and the varieties are propagated by budding or grafting on the species, and sometimes by cuttings. As, however, the operation of propagation, whether by seeds or otherwise, is slow, and, in the case of budding and grafting, somewhat difficult, amateurs will always find it preferable to purchase plants from the nurserymen. Hollies will grow in any soil in an airy situation, but they do not thrive in coal smoke. They prefer a loamy soil, but they will grow in sand, and also in strong clay; and, though not so well, on chalk or limestone. They make beautiful and permanent hedges, elegant single trees and picturesque groups; and, from the closeness of their foliage, they are very useful in shutting out any unpleasant objects. A Holly hedge is also well adapted for a street or road-side garden; as, while it serves as a screen, it has a cheerful look, both in summer and winter.

Illicium. — *Winteràceæ.*—Half-hardy shrubs, with very dark strongly-scented flowers, which smell like aniseed; and hence the popular name applied to the genus, of Aniseed Tree. Most of the kinds come from China, and are tender in British gardens; but *I. floridum*, an American species, is very nearly hardy, only requiring protection in severe winters. They should all be grown in peat; and they are generally increased by layers, though cuttings will strike in heat, under a bell-glass.

Impatiens.—*Balsamineæ.*—Noli me tangere. There are several annual hardy species of this genus, most of which are natives of Europe and North America, and have yellowish flowers; but some have lately been introduced with beautiful pink flowers from India. They are all distinguished by the seed-vessel springing open when it is touched, and discharging the seeds. All the kinds require a light soil, and abundance of water; and they are all large and widely-spreading plants.

Implements.—Those requisite for Floriculture are chiefly the spade; a three-pronged fork, with a long handle, and one with a short handle; the rake; the draw hoe, and thrust hoe; the spud; the trowel; the dibber; the pruning-knife, the budding-knife; the pruning-shears; the flower-gatherer; the short-grass scythe; and the roller. Besides these, there are various utensils, such as flower-pots of different sizes: watering-pots, with tubes and roses of different kinds and sizes; a syringe; a wire-sieve, with the meshes about half an inch square; hand-glasses and bell-glasses; baskets, wheelbarrows for plants, and mould; handbarrows for carrying large pots or boxes; fumigating bellows; a tin box for dusting plants with lime or powdered tobacco-leaves; a small painter's brush, for applying sulphur or soap-suds; and a sponge for cleaning the leaves of plants. These are the ordinary implements and utensils; but on a large scale there are some others, which may be added, such as the transplanter, averuncator, the garden-engine, the bill, the hedge-shears; the last two of which are, however, seldom used by ladies.

Inarching. — A species of grafting, in which the scion is only partially separated from the parent plant; in such a manner, that while it is uniting with the stock it derives a portion of its nourishment from the plant to be propagated. For this purpose the stock is either planted near the parent, or if in a pot it is placed near it, in such a manner that a branch from the scion can be readily joined to the stock. The stock is sometimes cut over immediately above its point of junction with the branch joined to it; but more frequently the stock is left at length. The stock may either be united to the scion by notching the one into the other, as in notch-grafting; or simply by paring a portion of the bark and wood from both scion and stock, and splicing them together, as in side-grafting. In either case the scion is made fast to the stock by tying them together with strands of matting, and the graft so formed is covered with moss tied on, or with grafting-clay, or grafting-wax. After a certain period, the scion and stock unite, when the former is separated from the parent, and the stock is cut over a little above the graft. After some further time, when the scion begins to grow vigorously, the stock is cut close over above the point of union, and the section left becomes in time covered with bark. Inarching is only adopted in the case of woody plants that grow with difficulty when grafted in the usual manner. The conditions of growth are the same as in independent grafting—viz. that the inner or soft wood of the stock must be placed exactly on that of the scion, to ensure their union. Inarching is generally applied to Camellias; and any person who has visited Messrs. Loddiges', at Hackney, Messrs. Chandler's, in the Vauxhall-road, or, in fact, any of the great Camellia growers, in April or May, must have seen some of the large old plants of the superior kinds, surrounded by a number of pots of the common single red, supported at different heights, for the convenience of reaching the different branches to which they have been united by inarching. The mode of grafting shown in *fig.* 21, in p. 129, has all the advantage of inarching, the scion being nourished by the water in the same way as it would be by its roots, in the case of inarching.

Indian Corn.—See **Zea.**

Indian Cress.—See **Tropæ'olum.**

Indian Fig.—See **Opuntia.**

Indian Shot.—See **Canna.**

Indigo is formed from the leaves of an Indian plant, called *Indigófera tinctòria*, belonging to the order *Leguminosæ*, and it requires a stove in England. The false Indigo, *Amórpha*, also belongs to *Leguminosæ;* and some of the species are hardy shrubs or low trees. See **Amo'rpha.**

Inga.—*Leguminosæ.* — Beautiful plants, nearly allied to the genus Mimòsa, with silky, tassel-like flowers. All the species are stove-shrubs, and *should be grown* in a mixture of loam and peat. They are propagated by cuttings, taken off at a joint, and struck in pure sand, under a bell-glass, and plunged in a hotbed or in tan, to afford them bottom-heat.

Inoculating. — This term, when applied to plants, is generally used as equivalent to that of Budding, which see in p. 33; but it is also applied to a mode of creating a grassy surface, either for a lawn or a pasture-field, by distributing fragments of turf taken from an established pasture over a newly-formed surface. Supposing the surface which it is intended to form into a lawn, to be levelled, dug, and smoothed, rolls of turf are procured from any suitable meadow or pasture, and cut into pieces, and laid down on the prepared surface at a foot or a foot and a half apart; and the intervening spaces are sown with grass-seeds, and the whole firmly rolled. The pieces of turf give an immediate character of grassy surface, and they are united in the course of a season by the growth of the intervening grass-seeds. It may be asked, why not use the grass-seeds alone, and save the expense of the turf? the only answer to which is, that the pieces of turf being green from the commencement, anticipate in idea the future effect that will be produced, and make sure of a grassy surface in case the grass-seeds should fail. The practice originated in Norfolk, and it is sometimes adopted in agriculture as well as in gardening.

Inoculating lawns with mushroom spawn is a practice sometimes adopted in gardens in the country, and affords at once a source of amusement in collecting the mushrooms, and of profit from their usefulness in the kitchen. It may be adopted in the case of any lawn, whether old or newly-formed. A few spawn bricks, as they are called, are procured from any person that grows mushrooms, or from the seed-shops; and these, being first broken into fragments, are inserted in the soil, either at a foot or a yard apart, according as it is wished to have the ground wholly or partially covered with mushrooms. The fragments are inserted about two inches in depth, and the turf is firmly pressed over them with the foot. The operation occasions no derangement of the turf, and it may be performed with the corner of a spade or a trowel. The time is April or May, and the mushrooms will make their appearance in the September or October following. The turf is not injured, and much amusement is sometimes produced by the unexpected appearance of the mushrooms.

Insects are extremely destructive to flower-gardens, particularly those belonging to the section Lepidoptera, which includes the butterflies and moths. Some of the Coleoptera, or beetles, are also very injurious, while in the grub state. It would take too much space in a work like the present, to give even the names of all the insects which injure flowers; but some of the most destructive are mentioned by their popular names as they occur in the alphabetical series, and a few words said on each. Entomology should, however, be studied by every one who loves flowers; as it is of great service to the florist to know these destructive creatures under all their changes. It is true that insects are, in most cases, only injurious in the caterpillar state; but often, by destroying a chrysalis,—or a moth, or butterfly, before it has had time to lay its eggs, the mischief which would have been done by the brood which would be raised from them may be prevented.

Instruments differ from implements in having steel edges or blades, and in cutting wood instead of separating soil. Those required for the flower-garden are knives of different kinds, cutting-shears, flower-gatherers, the scythe for mowing, and the bill, or the bill-hook, for cutting hedges. Knives are of many different kinds, and formerly all garden-knives were hooked at the extremity of the blade. It is now found, however, that this hooked form has a tendency to tear rather than to cut, and the best modern knives of every description have a straight cutting edge, and a sharp point, rather than a rounded one. Those which are used for pruning or cutting, generally have no particular form of handle; but those which are used for budding or grafting have an ivory handle, which terminates in a flat chisel-like form, for raising up the bark, when inserting buds. In general, it may be sufficient to observe, that a pruning-knife should have the extreme end of the handle thicker than the end next the blade, in order that it may never slip through the hands of the operator; and that it should be somewhat curved to give a greater purchase. A few glances at a cutler's, or in the seed-shops, would give a better idea of the sort of knives which an amateur ought to procure, than a page of directions; but purchasers should be cautioned against all complex forms, in which a number of blades, including saws and chisels, and sometimes also screw-drivers, gimblets, and hammers are included in the same handle. An excellent substitute for a knife for the lady gardener is found in the pruning-shears with a sliding motion, by which, what is called a draw-cut is produced, instead of what is called a crushing-cut, which bruises the bark, and renders the wound difficult to heal over. (See **Pruning Shears.**)

Inu'la.— *Compositæ.* — Elecampane. Some of the foreign species of this genus are very showy plants, all with orange-yellow flowers, and large coarse stalks and leaves. They are only suitable for large gardens or shrubberies, where they can have plenty of room. They will grow in any common garden soil, and they are increased by seeds, or dividing the root.

Ipecacuanha.—This drug is made from the root of *Viola* or *Ionidium Ipecacuanha*, a stove-plant in England, with pretty white flowers, and which should be grown in a mixture of loam and peat. It is propagated by cuttings, which strike root readily in sand, under a bell-glass.

Ipomœ'a.—*Convolvulàceæ*.-Beautiful climbing plants, annuals and perennials, many of which require a stove: but most of which, if raised on a hotbed in February, may be planted out in May to flower in the open air. All the species should be grown in a light soil, well manured with decayed leaves, or the very rotten part of an old hotbed. The most beautiful kinds are *I. rùbro-cærùlea*, which, if planted out in a warm border, will flower beautifully in the open air; and *I. Learii*, which, though it has as yet only flowered in a stove, will probably succeed with the same treatment. Both these kinds produce an astonishing number of flowers, though each flower lasts only one day, and sometimes if too much exposed to the sun, only a few hours; and both grow with great rapidity and vigour. *I. Learii* is, however, more shrubby than *I. rubro-cærulea*, and is generally propagated by cuttings, which strike rapidly by the aid of a little bottom-heat.

Ipomo'psis. — *Polemoniàceæ*. — Beautiful biennial Peruvian plants, with splendid scarlet flowers, which Professor Don, and some other botanists, class with the Gilias; and which were formerly called Cantua. They are free-growing plants; but as they are supposed to require protection during winter, they are generally grown in pots in England, and kept in a greenhouse. In America, however, it appears that these plants are found in a wild state in Georgia; and that they are left in the open ground all the winter, without any protection, in the neighbourhood of Boston, where the plants attain a size, (seven feet high,) and the flowers a brilliancy of colour quite unknown in Europe. They should be grown in a light and somewhat rich soil; and care should be taken to prevent their roots from becoming sodden with water, as when this is the case, they are very apt to damp off.

Iris. — *Iridàceæ*. — There are three distinct kinds of Iris, besides innumerable species, hybrids, and varieties. These are the fibrous-rooted kinds, which grow best in a fine sandy loam, and which increase rapidly every year by suckers from the roots; the tuberous-rooted kinds, which are very apt to be destroyed by snails, or to rot from too much wet; and the bulbous-rooted kinds, which should be taken up and replanted every second or third year, as the new bulbs, which are formed every season, are always directly under the old bulb; and thus in the course of a few years the bulbs descend so low as to be out of the reach of the air, and consequently incapable of vegetation. Thus it will be generally found that persons in the habit of growing Irises are always complaining of losing their plants, while the real fault rests with themselves for not taking up their bulbs at the proper time. The bulbous and tuberous-rooted Irises succeed best in sandy peat, or in any light and dry soil. The splendid Chalcedonian Iris is one of the tuberous-rooted kinds; and it not only requires a dry soil during winter, but to be allowed plenty of pure air during the whole period of its growth, or it will be very apt to damp off.

IRISH IVY.—The giant ivy, *I. canariensis*, which, though called Irish, is, in fact, a native of the Canary Islands.

IRISH YEW.—The upright growing yew, which forms a flame-shaped tree like the upright cypress, or Lombardy poplar, instead of spreading like the common kinds. When young, it makes a very handsome shrub, from the fine colour and luxuriance of its foilage.

ISA'TIS.—*Cruciferæ.*—*I. tinctoria*, the woad, is a British plant, used for dyeing blue, and which looks well in a miscellaneous border or shrubbery. Some of the species are dwarf plants, very suitable for rock-work.

ISOPO'GON.—*Proteàceæ.*—Australian plants, with very curious leaves and flowers, nearly allied to Banksia. They should be grown in peat and sand, mixed with a little turfy loam, and the pot should be a third filled with potsherds broken small. These plants are very difficult to cultivate, as they are very apt to damp off; the cuttings also are extremely difficult to strike.

ISO'TOMA.—*Lobeliàceæ.*—Annual and biennial plants, which may be sown in the open ground, or brought forward in a hotbed, and planted out in May. *I. axillàris* is a most beautiful and elegant plant, the flowers of which look like a large lilac jasmine.

I'TEA.—*Ericàceæ.*—A little hardy American shrub, which requires peat soil in British gardens.

IVY.—See HE'DERA.

IXIA.—*Iridàceæ*—Bulbous-rooted plants, with very beautiful flowers, which vary exceedingly in colour and form. They are all natives of the Cape of Good Hope, and they are generally grown in pots in greenhouses; but as, when thus treated, their slender stems are apt to become etiolated, and consequently very weak, they do much better in the open garden, treated in the following manner, in the climate of London :—A bed of any width and breadth that may be required, should be dug out to the depth of two or three feet, according to the nature of the soil, a retentive clay requiring to be dug deepest. This bed should have a third part of its depth filled with pebbles, brick-bats, or any other draining material. A stratum of fresh turfy loam should be laid on this, and above it a stratum of rotten cow-dung, so as to fill the bed to within about a quarter of its depth from the surface of the ground. The bed should then be filled with a mixture of light turfy loam and sand, the loam being broken or chopped small, but not sifted. The surface of the bed should be raised two or three inches above the level of the surrounding border; and it is most desirably situated, if backed by a south wall, and sloping from the wall to the gravel-walk. In this bed the Ixia roots should be planted in quincunx; and if they are protected by a thatched covering raised on a slight wooden frame during winter, they may be left in the ground several years without sustaining any injury. In the north of England, or in any cold wet climate, the Ixias may be planted in October in pots, well drained, with a layer of cow-dung over the drainage, and filled up with a mixture of turfy loam and sand. The Ixias should be planted three in each pot; and the pots should be plunged into a hotbed, and covered with a glass frame during winter. In spring, the glasses may be gradually removed, and when the flowers are nearly ready to expand, the pots may be removed to the greenhouse, or the window of a sitting room. Where the soil of a garden is a fat yellow loam, or a chalky or other porous subsoil, and the situation dry and yet sheltered, the bulbs may frequently be planted in the open ground, and left there for years, without any other care than covering them with a heap of dead leaves during winter.

Ixo'ra.—*Crassulàceæ.* Splendid stove plants. The history of *Ixora coccinea*, the best known species of the genus, is rather curious. It is a native of China, and some of the East India islands, where it is worshipped as a sacred plant; and where it is said to form a small tree about six feet high, rising with a single stem, and having its head formed entirely of clusters of bright scarlet and yellow flowers, whence it has received the names of *Flamma Sylvarum*, and the Tree of Fire. This plant was first introduced in 1690; but it was soon lost, and its existence was even doubted till it was re-introduced about a hundred years afterwards by the celebrated Doctor Fothergill. After this, seeds were obtained by several nurserymen, and the plant was so much admired that it was sold for several years at five guineas each. It is now common in collections, but it is rather difficult to keep; as, though it requires a moist heat, it will die if its roots are suffered to retain any stagnant moisture among them, and it must not be plunged either in tan or in a hotbed. It is also very liable to be attacked by insects.

J.

Jaca or Jack Tree.—A species of Artocarpus, or bread-fruit.

Jacara'nda. — *Bignoniàceæ.*—A climbing plant, a native of Brazil, with beautiful lilac flowers, shaped like those of the Catalpa. The wood is said to be the rosewood of commerce. In England it requires a stove. It should be grown in a mixture of loam and peat, and it should be kept nearly dry during winter. It is propagated by cuttings, which should not be deprived of their leaves, and which must be struck in pure sand under a glass. Some persons suppose the rosewood to be a kind of Mimosa.

Jackso'nia—*Leguminòsæ.*—Australian shrubs, generally kept in a greenhouse in England; and which should be grown in peat. They are easily propagated by cuttings.

Jacobæa.—The plant usually called by this name is a species of *Senècio*, or Groundsel. It is also called Purple Ragwort. See Sene'cio.

Jacobæa Lily.—A splendid bulbous-rooted plant, formerly called by botanists Amaryillis formosissima, but the name of which is now changed to *Sprekelia*, which see.

Jacquinia. — *Myrsineæ.* — West Indian trees and shrubs, with showy flowers, requiring a stove in England. They should be grown in loam and sand, and are propagated by cuttings.

Jalap.—The plant producing Jalap was formerly supposed to be a kind of Marvel of Peru; but it is now discovered to be a kind of Convolvulus, or Ipomœa.

Jambos, or the Rose Apple.—A kind of Eugenia, belonging to the order Myrtaceæ.

Jasio'ne. — *Campanulàceæ.* — Sheep's Scabious. An English weed.

Jasmine.—See Jasminum.

Jasmi'num. — *Oleineæ.* — The Jasmines are shrubs remarkable for their fragrant flowers; and the common species, *Jasminum officinàlè*, is one of our most vigorous-growing wall-evergreens, though a native of India. There are several species hardy in British gardens, but the greater number require the greenhouse or stove. The principal hardy species is that already mentioned. It well deserves a place against the wall of a house, or the piers of a veranda, which it will cover in a very short time; or if planted against trellis-work, or against the frame-work of a bower, it will soon afford an agreeable shade, and produce its long, graceful, deep-green shoots, in such quantities, as, after covering the bower, to hang down to the ground all round it, and require to be separated like a curtain by a person entering. This plant and the common Ivy, when trained up a single post, with a spreading umbrella top of frame-work, form some of the finest objects in small gardens by their pendent branches, which not only hang down from a height of from 15 feet or 20 feet to the ground, but trail along it to a considerable distance. Like the Ivy, the common Jasmine is an evergreen; not, however, from its leaves, but the deep green colour of its shoots. The flowers are white, and very fragrant, and yield an oil similar to that produced by *J. grandiflorum*. *J. revolutum* is a native of Nepaul, with yellow blossoms, and thrives against a wall, where it grows with great vigour, covering a large space in a short time. *J. fruticans* and *J. humile* are upright border shrubs, with yellow flowers, deciduous leaves, but deep green shoots. *J. grandiflorum* is a hothouse shrub that bears a good deal of resemblance to the common Jasmine, and yields the oil of Jasmine of the shops. *J. odoratissimum*, from the Azores, has yellow and very fragrant flowers and broad evergreen leaves. *J. azóricum*, a native of Madeira, requires the greenhouse, has white flowers, and is very fragrant; and *J. Sambac*, a stove species, of which there is a variety with double flowers, is most fragrant during the night. It is to this species that Moore alludes in his beautiful lines on the Jasmine. There are several other species, but all are climbers excepting *J. fruticans* and *J. humile*, already mentioned. They will all thrive in any common garden-soil, mixed with leaf-mould; and they may be all propagated by cuttings planted in sand, and covered with a hand-glass.

JATRO'PHA. — *Euphorbiàceæ.*— The Physic-nut. West Indian trees and shrubs, which abound in a poisonous juice, but which, when this is pressed out, are wholesome and nourishing. The substances called Tapioca, and Cassava-bread, are made from *Jatropha Mánihot.* In England all the species must be grown in a stove, in a mixture of sandy loam and peat. They require small pots and very little water; and they are propagated by cuttings.

JEFFERSO'NIA—*Podophyllàceæ.*— An American marsh plant, which is generally grown in peat-soil, kept moist. It is increased by seeds, or dividing the root.

JERUSALEM SAGE.—See PHLOMIS.

JET D'EAU.— A fountain, which consists of a single column of water, rising straight up out of the ground. See FOUNTAINS.

JONQUIL.—A kind of Narcissus.

JUDAS TREE—*CércisSiliquástrum* —A low tree, producing numerous racemes of beautiful pink flowers, from the old wood of the trunk and branches. It grows freely in any common garden-soil, but prefers a warm and sheltered situation; and it flowers best against a wall. The flowers have an agreeable and slightly acid taste; and they are eaten in France, fried in batter, as fritters. There are several varieties, but the only distinct species is *C. canadénsis*, a native of North America. As these plants bear abundance of seed, and grow rapidly, they are often raised from seed; and hence the great number of varieties. They may also be propagated by layers.

JUJUBE TREE.—The lozenges called Jujube, are made from the fruit of

Zízyphus vulgàris, which ripens abundantly in the neighbourhood of Paris; but the real Jujube-tree is *Z. Jujuba*, a native of the East Indies, which requires a stove in Europe. Both are nearly allied to *Paliurus*, or Christ's Thorn.

JULIBRISSIN.—This beautiful tree, which is a kind of Acacia, is called the Silk Tree, from the abundance and silkiness of its long, fine, tassel-like blossoms. It is rather tender in England, but it grows freely in Italy. See ACACIA.

JUNIPER.—See JUNI'PERUS.

JUNI'PERUS. — *Coniferæ* § *Cupressineæ*. — The Juniper. Evergreen shrubs, natives of different parts of the world, but most of which are hardy in British gardens. They all thrive in common soil, mixed with sand, or in heath mould; and they are generally propagated by seeds, though they will all root from cuttings. *J. commùnis*, a native of Britain, of which there are several varieties, is a very common hardy evergreen, sometimes found in the form of a low bush, and at others in that of a conical tree, like the Cypress. It bears clipping, makes excellent garden hedges, and was formerly cut into a great variety of shapes. The fruit is used throughout Europe to flavour ardent spirits (the spirit called Hollands being made from it), and the wood is burned in ovens or kilns to flavour dried beef, hams, or fish. *J. virginiàna*, the Red Cedar, is one of the most common of small evergreen trees, or large shrubs. It is raised from seeds, and the male and female plants being of different sizes, the individuals vary exceedingly in form and their manner of growth; so that a number of plants of this species may exist in a shrubbery or pleasure-ground, and yet not two of them be alike. *J. excélsa* is a tall, Cypress-like shrub, or low tree, very hardy and very ornamental. *J. recurva*, a native of Nepaul, is a very elegant plant, with drooping shoots, well adapted for cemeteries. It is one of the hardiest of the species, and thrives even in the smoke of London. *J. Sabina*, the common Savin, is one of our most ancient garden shrubs, being almost the only coniferous evergreen planted in the time of Queen Elizabeth; and there are several varieties of this species, all of which are beautiful. The fragrance of all the Junipers is resinous and refreshing, and many of the kinds are used in medicine. The wood used in making lead pencils is generally that of the red cedar; or of the Barbadoes Cedar, *Cedrela odoràta*, which last is a stove-plant in England.

JUPITER'S BEARD. — *Anthýllis. Barba Jovis*.—An ornamental, low shrub, which will grow in any common garden-soil, and is propagated by cuttings.

JUSSIEUA.—*Onagràriæ*.—Aquatic shrubs, with large yellow flowers, resembling those of the Œnothera, or yellow evening primrose. Natives of South America, and only half-hardy in Britain. See AQUARIUM and WATER PLANTS.

JUSTICIA. —*Acanthàceæ*. — Stove plants, with showy and curious flowers. They require a rich light soil, or a mixture of loam and peat; and flower freely with moderate care. They are propagated by cuttings, which strike readily in sand, under a hand-glass, and with bottom-heat.

K.

Kalmia.—*Ericaceæ.*—The Calico Laurel. Low shrubs, with beautiful flowers; natives of North America. They may be grown with perfect safety in the open air, or they may be kept in a greenhouse and forced, so as to flower in February. They are generally grown in peat earth, on account of their numerous, hair-like, fibrous roots; and they may be removed even when in flower, without injury, if sufficient care be taken. They are propagated by layers, or by seeds, which are received every year in large quantities from America. The seeds should be sown in pots, in sandy peat, or heath mould, as it is called; and they should be very thinly covered. When the plants come up, they should be transplanted into other pots, putting three in each, and they should not be removed to the open ground till they are five or six inches high. They should be planted out in spring.

Kalosa'nthes. — *Crassulàceæ.*— Mr. Haworth's name for *Crássula coccinea,* and some of the allied species. See Crassula.

Kaulfussia. — *Compositæ.* — A beautiful little annual, resembling an aster; the ray florets of which curl curiously back after it has been expanded a short time. This plant was formerly considered half-hardy; but it is found only to require sowing in the open border in April, to flower in May or early in June. Its beauty is, however, very short-lived; as its flowers have generally all faded, and its seeds ripened before the end of July. It has been named Charieis by Professor De Candolle, but the name has not been generally adopted.

Keel. — The lower part of the flower of a pea-flowered plant, consisting of two petals, so closed together as to resemble a little boat.

Kennedia. — *Leguminosæ.* — A genus of well-known plants, with showy flowers, which has been lately divided by Mr. Bentham into four new genera, viz.: — Hardenbergia, comprising the species with small bluish or lilac flowers on slender branches, the type of which is *K. monophỳlla;* the Zichyas, having bunches of broad reddish flowers, with very short keels, as for example, *K. coccineæ;* the Kennedias, with large scarlet or crimson flowers, having long keels; and the Physalobiums, having flowers a good deal like those of the Zichyas, but with bladdery capsules. All the Kennedias are Australian climbing or trailing shrubs, which require a greenhouse in England, and should be grown in heath mould, or very sandy loam, mixed with peat. They are propagated by cuttings, which strike readily in sand, under a bell-glass.

Kerria. — *Rosaceæ.* — By some mistake, Kerria Japonica was at first supposed to belong to Corchorus, a genus of Tiliaceæ, and of course nearly allied to the Lime-tree; to which it bears no resemblance, though it is still called Corchorus Japonica in the nurseries. It is also singular, that though the double-flowered variety was introduced into England in 1700, the species was not introduced till 1835. It is a delicate little shrub, too slender to support itself in the open air; but when trained against a wall, flowering in great profusion. It should be grown in a light rich soil, and it is propagated by cuttings.

Kidney Vetch.—See Anthyllis.

Knapweed—*Centaurèa scabiòsa.*

Knautia. — *Dipsaceæ.* —A very pretty little flower, requiring only the usual treatment of hardy annuals.

Knight's Star.—A kind of Amaryllis, considered by some authors as forming a separate genus called Hippeastrum.

Knives are used in gardening for pruning, and also for budding and grafting. Pruning-knives were formerly characterised by hooked blades; but as we have already mentioned under the article Instruments, straight-edged blades are now preferred, as making a cleaner cut. The best description of budding-knife is manufactured by H. Verinder, St. Paul's Church-yard; it has a straight blade, the upper half of the back having also a cutting edge, and the handle is terminated by a rounded end. A great variety of garden-knives, of improved constructions, are manufactured by Messrs. Rogers and Sons, cutlers, Sheffield; and of pruning-shears, of excellent kinds, by Messrs. Wilkinson, of the same place.

Knowltonia.—*Ranunculàceæ.*—Half-hardy perennial plants, natives of the Cape of Good Hope, nearly allied to Adonis vernalis. They should be grown in peat, mixed with a little loam; and they are increased by dividing the roots.

Kochia.—*Chenopodiàceæ.*—Belvidere or Summer Cypress. An annual plant, formerly much cultivated in gardens, to gather for beaupots to place in the fire-places during summer; but which now is rarely seen. About a century ago many plants were grown for these large beaupots, but as they are now no longer used, the flowers that were to supply them are neglected. Kochia is quite hardy, and only requires sowing in the open ground.

Kolreuteria. — *Sapindaceæ.* — A middle-sized deciduous tree, a native of China, but quite hardy in British gardens, and very ornamental from its large variously-divided foliage, and its conspicuous terminal compound spikes of rich yellow flowers. These are freely produced in the climate of London, and are often succeeded by bladdery capsules, which contain seeds; and from these, or cuttings of the roots, it is readily propagated. It will grow in any soil, and does not altogether dislike coal smoke.

Koniga.—*Cruciferæ*—The Sweet Alyssum. A pretty little annual, with white sweet-scented flowers, often used as an edging-plant to beds and borders. It only requires sowing in the open ground in March.

L.

Labels are pieces of wood, parchment, or metal, bearing the name of the plants, and tied to them. When the names are affixed to a piece of wood or metal, stuck into the ground, they are called tallies; and of these there are many kinds. See Tally.

Lablavia. — *Leguminosæ.* — The Egyptian Bean, formerly called *Doleibos Lablab,* but now *Lablàvia vulgàris.* A half-hardy annual climbing plant, or biennial plant, which only requires the usual treatment of similar plants. It has a very showy flower.

Laburnum.—See *Cytisus.*

Lacebark.—See *Lagetta.*

Lachena'lia. — *Asphodeleæ.* — Cape bulbs, with very showy flowers. They will not need taking up in winter; but must be grown in pots in a greenhouse, and allowed very little water at that season. They are generally grown in loam and peat, mixed with a little leaf-mould.

Ladanum, or *Labdanum.*—A gum produced by some of the kinds of Cistus, quite different from Laudanum, which is a preparation from Opium, and made from the Poppy.

Ladies' Bedstraw.—See Galium.

Ladies' Mantle.--See Alchemilla.

Ladies' Slipper. — See Cypripedium.

Ladies' Traces.—See Spiranthes.

Læ'lia. — *Orchidaceæ.* — A very beautiful epiphyte, which may be grown with its roots wrapped in moss, and fastened on a piece of wood; or in the husk of a cocoa-nut. The flowers are extremely beautiful and very delicate. See Orchideous Epiphytes.

Lagena'ria. — *Cucurbitàceæ.* — The Bottle Gourd. An East Indian species of Gourd, which is sometimes grown on account of its curious shape; but the pulp of which is poisonous.

Lagerstrœmia. — *Lythrarieæ*, or *Salicariæ*. The Pride of India. Beautiful trees, with flowers, something like those of the Clarkia in form, but much more brilliant in colour. *L. indica* is generally grown in the stove, but the other species succeed if planted in the open ground in a conservatory.

Lagetta. — *Thymealeæ.* — The Lacebark Tree. A shrub or low tree, a native of Jamaica, remarkable for the number of divisions into which its liber or inner bark may be split. This inner bark slips off the wood without difficulty; and when divided, it is so fine, and lace-like in its texture, that Charles II. had a collar and ruffles made of it. In England the plant requires a stove, and to be grown in a mixture of loam and peat. It is propagated by cuttings, which are rather hard to strike. The flowers are white, and in shape they resemble those of the Mezereon; but instead of being produced in clusters round the stem, they grow on a kind of spike, far apart from each other.

Lamium. — *Labiàtæ.*—The Dead Nettle. Annual and perennial plants that are quite hardy in the open ground in Britain; but which succeed best in a light rich soil.

Lanta'na.— *Verbenàceæ.*--Greenhouse and hothouse plants, with pretty flowers, nearly allied to the Verbenas; and the half-hardy ones requiring the same treatment. See Verbena.

Lapeyrousia. —*Iridàceæ.*— Cape bulbs, with pretty flowers, which may be planted in a warm border, and left in the ground during winter, if protected during that season by a hand-glass, &c., from frost, or heavy rain.

Larkspur.—See Delphinium.

Lasiope'talum —*Bytterniàceæ.*— Australian low shrubs, which require a greenhouse in England, and are grown in loam and peat, and propagated by cuttings.

Lasthe'nia. —*Compositæ.*—Californian annuals, with bright yellow flowers; which require the usual treatment of Californian plants.— See Californian Annuals.

La'thyrus. — *Leguminosæ.* — A genus of vigorous-growing, very ornamental perennials and annuals, of which those best known are *L. latifòlius*, the everlasting Pea, with pink flowers, and a variety with pure white flowers, both growing to the height of six feet or eight feet when supported by sticks, in the manner of common Peas, or trained to a trellis; *L. grandiflòrus*, a perennial remarkable for the large size of its flowers; *L. odoràtus*, the common Sweet Pea, an annual remarkable for the fragrance of its blossoms, which are of various colours; and *L. tingitànus*, the Tangier Pea, a tall-growing plant, the flowers of which are dark purple. Another very interesting species is Lord Anson's pea, *L. magellànicus*, a perennial plant, interesting from the beauty of its foliage and its blue flowers, and not nearly so much cultivated as it ought to be: against a wall, it is a rare, and at the same time a very elegant species. There are many others, both annuals and perennials, all of which are more or less showy, and being of vigorous growth are well adapted for broad borders. They will grow in any common soil; the annuals are propagated by seeds, and the perennials by division of the root.

Laurel.—See Ce′rasus.

Laurus.—*Lauràceæ.*—The Sweet Bay, *L. nobilis*, is a very handsome evergreen shrub or low tree, with dark green leaves. It is somewhat tender, and requires a sheltered situation. The male and female flowers are on different plants; and the former, which are of a rich yellow, are by far the most showy. It will grow in any common soil, and it is propagated by layers. The leaves are used to flavour custards. The fruit of the female plant is a round dark purple berry, produced in abundance in fine seasons; but, unfortunately, in nurseries, the male plant is by far the most common.

Lava′ndula.—*Labiàtæ.*—The Lavender is a low suffrutescent bush, well known for the fragrance of its flowers, and for an oil which they yield by distillation in water. *L. Stœchas*, the French Lavender, is a more ornamental plant than the common kind, but somewhat tender. Both require a dry calcareous soil, and an open airy situation. The common Lavender is cultivated on a large scale at Mitcham, and also at Henley-on-Thames. At both places it is propagated by cuttings of the young wood planted in autumn, and seeds are sold in the seed-shops.

Lava′tera.—*Malvaceæ.*—A very showy annual, common in flower-gardens, which only requires sowing in the open border in March or April. There are also two shrubbery kinds. See Tree Mallow.

Lawn.—Smooth mown turf, when of any extent in pleasure grounds, is called a lawn; and its chief beauties are the uniformity of its surface, and uniformity in the kinds of grasses which cover it, and which produce an uniform tone of green. These objects are produced by first preparing the soil, which should be a sandy loam, or a loam slightly inclining to sand, of a foot or more in depth, and equally drained throughout, so as everywhere to retain the same degree of moisture. Next the same mixture of grasses should be sown throughout, and lastly they should be mown at regular intervals, say of a fortnight during the summer months, and a month during spring and autumn. Whenever coarse grasses, or broad-leaved plants of any kind appear, they should be taken out with the spud; and whenever any spot becomes bare, the soil should be renewed, and pieces of fresh turf introduced, or seeds sown; also, when worms disfigure the surface, the castings which they throw up should be scraped off, and the surface watered with lime-water, by which all the worms will be destroyed. In general, it is impossible to produce a fine lawn, except in an open, airy situation, with a soil which will retain moisture during summer; for in close pent-up places, surrounded by walls or hedges, and under the drip of trees and shrubs, no kind of grass will grow. In such places, all that can be done is to encourage the growth of moss, which will spring up naturally wherever the soil is kept sufficiently moist; but where it is very dry, the branches of the trees and shrubs should be allowed to trail on the surface, so as completely to cover it. In some situations, where the branches of the trees and shrubs do not lie close to the surface, or where they are chiefly of deciduous kinds, the surface may be clothed with ivy or periwinkle. In very small gardens, grass plots are generally formed by rolls of turf taken from the surfaces of some adjoining pasture-field or meadow; but when grass-seed is sown, the following kinds are considered the best:—Fox-tail meadow grass, *Alopecùrus praténsis*, which should form one-fourth of the whole; the sweet-scented spring-grass, *Anthoxánthemum odoràtum*, which gives the fragrance to new hay; and *Pòa praténsis*, the common meadow-grass. To these may be added the crested dog's-tail-grass, *Cynosùrus cristàtus*, and the hard fescue grass, *Festùca duriúscula*, with about the proportion of a bushel of white clover-seed to four bushels of the other mixture; and this quantity will suffice for an acre of ground.

Layering is a mode of propagating used both in the case of ligneous and herbaceous plants, and the operation is performed by choosing a young shoot of the current or the preceding year, bending it down to the ground, covering a portion of it near the extremity of the shoot with an inch or more of soil, previously fixing it there with a hooked stick. In general, layers of woody plants made in autumn may be taken off about the same season the following year; but some trees and shrubs, such as Magnolias, the tree Ivy, &c., require to remain on the tree for two years. Roses layered in the summer season with shoots of the same year's growth may be taken off the following spring; but the general practice is to lay them in autumn or winter, and allow them to remain on the plants for a year. Layers of herbaceous plants, such as Carnations, Pinks, double Sweet Williams, and Chrysanthemums, made in the beginning of summer, will have made roots by the autumn; and the layers of Chrysanthemums so rooted will flower the winter of the same year. To facilitate the rooting of all layers, whether ligneous or herbaceous, a notch or slit is made in that part of the shoot which is buried in the soil; or it is twisted, or a portion of the bark taken off, or in some other way wounded, bruised, or injured, so as to check the return of the sap by the bark, when the sap accumulating at the upper lip of the wound, forms a callosity there of granulated matter, from which roots are soon after emitted. In laying herbaceous plants, and more especially Carnations, the slit is made on the under side of the shoot, and in the case of woody plants on the upper side. In both cases, the knife is entered immediately below a bud or joint; roots being always more freely protruded at the joints of plants, than in the intervals between them. The cut is generally made half through the shoot, and continued up half an inch or an inch, and to keep it open a small splinter of wood, or a small flat stone, or a piece of slate, or a potsherd, is put in between the divided parts to irritate the wound and cause it to protrude granulous matter. In laying herbaceous plants, it was formerly the custom to shorten the leaves remaining on the layer, but in modern practice this is considered unnecessary and even injurious, by lessening the powers of the leaves to elaborate the sap. The leaves are always stripped off that part of the layer which is buried in the soil. In layering some woody plants, such as certain kinds of roses, tree Peonies, &c., the entire shoot is laid down, and the knife entered immediately below each eye; and, the wound being kept open by splinters of wood or stones, the whole shoot is covered with earth to the depth of half an inch or an inch, according as the soil is sandy or loamy, and a shoot is afterwards sent up from each eye, so that a shoot thus laid down produces nearly as many plants as it has buds. This practice is much more successful with some kinds of shrubs and trees than with others, and it is not at all applicable to herbaceous plants. Some shrubs, such as the Honeysuckle, Tecoma, Wistaria, &c., which produce long shoots, and continue growing throughout the summer, may be pegged down as they grow, and the slit made behind each bud, or every other bud, covering the joint so treated with soil. A great many plants are thus produced from a single shoot in one season, more especially in moist, warm summers, or in a warm situation, where water is applied artificially. Layers of every description root most freely in sandy soil, in an open airy situation; and those which are difficult to root succeed best where the soil is almost a pure sand. The layering of Carnations is an operation particularly suitable for ladies, more especially when the plants are in pots, as they can be placed on a table or bench, and there will be no occasion for stooping.

Laying in by the Heels.—When plants are taken up for removal, if they cannot be planted immediately, they are generally laid together horizontally, in a trench made for that purpose; and the roots covered with earth. This is done to prevent the roots from becoming dry and withered, which they would do if they were left exposed to the open air for any length of time.

Leadwort.—See Plumba'go.

Leaf-Mould is formed of decayed leaves, and is one of the most useful materials in the culture of flowers. All plants whatever will grow in leaf-mould, mixed with loam and sand; and many plants will grow in leaf-mould alone. It is particularly useful for growing plants in pots, especially Pelargoniums, Fuchsias, Petunias, Brugmansias, &c.; and in many cases it may be used as a substitute for heath-mould. Leaf-mould is formed by sweeping up the leaves of trees and shrubs in autumn and winter, and laying them in heaps in a convenient place to rot, turning them over occasionally, so as to expose continually a new surface to the action of the air. At the end of a year, a considerable portion of the leaves will have become mould, and may be separated from the rest by sifting; and at the end of two years, the whole will have become one mass of mould. If it were required to grow any kind of herbaceous plants to the largest possible size, within a given time, I do not know how it could be better done than by placing the plant in the centre of a bed, three or four cubical yards deep, of leaf-mould mixed with coarse sand, thoroughly drained by a stratum of stones at the bottom, and amply supplied with water. Pine-apples in France, and Melons in Holland, are grown to an enormous size in only leaf-mould and sand. The best substitute for leaf-mould is heath-mould, mixed with sifted very rotten dung. Or rotten dung alone may be used, if it has become so thoroughly decayed as to form a kind of mould.

Leather Wood.—See Dirca.

Leaves are, next to roots, the most important parts of plants. With a root a plant will begin to grow, but unless the leaves which it produces are allowed to come to maturity, it will soon cease to live, because it is in the leaves alone that the moisture imbibed by the roots is elaborated into the sap or vital juice of the plant. Nothing so decidedly shows the ignorance or knowledge of a gardener as the manner in which he treats the leaves of plants. Those of bulbs many gardeners will, if not prevented, cut off as soon as the plants have done flowering; and in general gardeners wish to perform the same operation on all herbaceous plants after they have flowered. When a man of this description makes a layer or a cutting of a shoot that has the leaves on, he either takes them off entirely or cuts off their tips, not knowing that it is by means of the leaves alone that such cuttings can produce roots. (See CUTTINGS.) At the base of every leaf there is the rudiment of a bud, either visible or dormant, and unless the leaf be allowed to come to maturity, this rudiment is killed or prevented from becoming a vital germ. Wherever buds are required, therefore, it is necessary to preserve leaves. But leaves not only return sap to the buds at the base of their petioles, but through these petioles they return sap to the general circulation of the plant; and hence, the growth both of the roots of the plant and its shoots depends entirely on the number of its healthy leaves. Leaves perform their office of elaborating the sap by exposure to the light and air, and more especially to the direct influence of the sun; therefore it is not sufficient to preserve the leaves which a plant produces, it is also necessary to prevent them from being darkened by adjoining plants or other objects, or from darkening other leaves. This in some cases requires thinning both of leaves and shoots; but more generally it may be effected by placing the plant in an open airy situation. As the progress of a plant, therefore, after it is once originated, and planted in a proper soil and situation, depends entirely on the leaves and on their treatment; it follows that the growth of the plant may be in a great measure checked by the removal of the leaves, either before they have burst from the bud or immediately afterwards. In this way Mr. Beaton has reduced the shoots of the most vigorous-growing fruit-trees without ever once using the knife. The same principle may be applied in the case of every other description of plant.

Leaves are also occasionally used instead of manure or tan, for hotbeds; and very frequently for what are called linings to old hotbeds, the heat of which has decreased.

LECHENAU'LTIA.—*Goodenòviæ.*—There are two species of this well-known genus, both natives of New Holland, and both conspicuous for the great abundance of their dark scarlet flowers. *L. formòsa* is very common in windows, greenhouses, and small balconies; but, though it is so general a favourite, few people can keep it long. The fact is, that though it does not belong to the same natural order as the heath, it very much resembles it in habit, and it is even more easily killed. The Lechenaultia should be grown in heath-mould mixed with a little loam, and treated exactly like a heath: that is, never suffered to become too dry, and never saturated with water. It should be potted high, so as to leave the collar above the mould in the centre of the pot; and when kept in a balcony, the pot in which it grows should be placed within another pot, so that the roots may not be injured, by the outside of the pot becoming heated by the sun. The most important point, however, is to allow the plant plenty of air, as it will not live without abundance of both air and light. *L. Baxtèrii* is much more beautiful than the old species, as the flowers are much larger and more brilliant, but it requires the same treatment.

LE'DUM.—*Ericàceæ.*—The Labrador Tea. American low shrubs, with pretty white flowers, which require to be grown in peat and sand, heath-mould, or very sandy loam. *Lèdum buxifòlia*, the Sand Myrtle, is frequently called *Ammyrsìnè buxifòlia* in the nurseries. It is a very pretty, compact-growing little plant, with box-like leaves, and clusters of white flowers, which have a pink tinge on the back of the petals. It is very suitable for beds in a geometric flower-garden, or for rockwork, but it requires a slight protection during severe frosts.

Leguminous Plants.—Plants that produce their seeds in a pod or legume, like the common bean and pea; some of them have pea-flowers, and others have tassel-like flowers, like those of the Acacias.

Leiophy′llum.—Another name for *Lèdum buxifòlia.*

Lemna.—Duckweed.

Lemon.—See Ci′trus.

Leoni‵tis.—*Labiàtæ.*—Lion's-ear. Shrubby plants, from the Cape of Good Hope, with scarlet or orange flowers, which are produced in whorls round the joints of the stems. The flowers are produced in autumn, and the plants require a light rich soil.

Leo′ntodon.— *Compósitæ.* — *L. taráxacum* is the common Dandelion.

Leonu‵rus.—*Labiàtæ.*—Motherwort. Annual and biennial plants, with reddish or purplish flowers, natives of Europe, quite hardy in any common soil.

Leopard's Bane.--See Do′ronicum.

Leptosi‵phon. — *Polemoniàceæ.* —Pretty Californian annuals, nearly allied to Gilia, which will bear a moderate degree of cold better than too much heat. For their culture, see Annuals.

Leptospe′rmum. — *Myrtàceæ.* — Very pretty Australian half-hardy shrubs, with white flowers, which are generally kept in a greenhouse in England, but which may be grown in the open air, with a slight protection during winter. They require a sandy loam mixed with peat in nearly equal quantities: and they are generally propagated by cuttings, as the plants which are raised from seed are a long time before they flower.

Lespede‵za.—*Leguminosæ.*--Pea-*flowered* perennial plants, nearly allied to the French Honeysuckle; which only require to be planted in any common garden soil, in the open borders.

Lesse′rtia.— *Leguminòsæ.*— *L. púlchra* is a pretty little half-shrubby plant, with purplish-red pea-flowers, which are produced in May. It is a native of the Cape of Good Hope, and it is generally kept in a greenhouse.

Leuco‵jum. —*Amaryllidàceæ.* — The Snow-flake. Beautiful bulbous-rooted plants, natives of Europe, as hardy as the common Snow-drop, and requiring the same treatment, except that they do not succeed quite so well under the drip of trees.

Leucopo‵gon.—*Epacrìdeæ.*--Australian half-hardy shrubs, with spikes of feathery white flowers. They are very abundant in the temperate regions of Australia, and only require a slight protection in England during winter.

Leuco′thoe.—*Ericàceæ*—One of the new genera into which Professor Don has divided the genus Erica.

Levelling is an operation which is required on a large scale in laying out gardens, and on a smaller scale in digging uneven ground. In either case, care should be taken to keep the best soil on the surface, so that when a hill is to be lowered in order to fill up a hollow, the first operation is to take off the surface of both, and reduce the ground to a uniform inclination or level, by removing the subsoil; and replacing the surface soil afterwards evenly over the whole. In practice it is seldom, if ever, desirable to reduce a surface to a perfect level, because in that case the rain which fell on it would not readily run off. An inclination should generally be given from one side to the other; or, when the plot is a square, from the centre to all the sides; and this inclination may be so gentle as to render it quite impossible to be detected by the eye alone. A piece of ground fifty feet broad may have an inclination of three inches, if the soil be loamy and retentive; but if it be sandy and absorbent, an inch and a half will be sufficient. In levelling lawns, no part whatever of the surface ought to be on what is called a dead, or perfect level; because as the grass retains the water on the surface like a sponge, if the soil be loamy, it will soon become mossy and unpleasant to walk on during the whole of the winter and spring. All flat lawns, therefore, on clayey soil, ought not only to have a gentle inclination, but frequent drains, the stones in which ought to be brought up to within a few inches of the surface. In arranging the inclination of dug surfaces, care should be taken that the water is not thrown on the gravel-walks; for which purpose drains are requisite in the marginal borders,—though in general, dug soil, if the stratum be not retentive, is sufficiently absorbent to render such drains unnecessary, the superfluous water of the subsoil finding its way to the drains of the walks.

Leycesteʹria.—*Caprifoliàceæ.*—*L. formòsa* is a very handsome plant, with long spikes of reddish flowers, which will not only thrive, but grow more luxuriantly in the immediate neighbourhood of the sea, than in any other situation. It is a native of Nepal; and was introduced in 1824. It was, however, soon lost through injudicious treatment--probably through keeping it too warm; but it has been lately reintroduced, and it is now found to grow vigorously in the open ground. It is propagated by cuttings and seeds.

Liatris. — *Compòsitæ* — Weedy-looking hardy perennials, with purplish flowers, which will grow in any common garden soil, and are increased by dividing the roots.

Lichen. — *Cryptogamia Lichenes.* — Moss-like plants, generally found on old walls, desert heaths, or the bark of old trees; also frequently on dead wood.

Light is as essential as air and water to plants; and without abundance of light, plants are neither vigorous in themselves, nor properly coloured. When greenhouse plants are kept in imperfectly lighted plant-houses, or in half-darkened rooms, it is really painful to witness the efforts they make to catch as much light as they possibly can; their stems become weak, from being unnaturally elongated, or drawn up and twisted, in their efforts to reach the light, and their flowers are pale and of very little value. In those towns where the atmosphere is thickened by coal-smoke, the light never has the same beneficial effect as in the open country, where there is nothing to prevent it from exercising its full influence over the plants.

Lignum Vitæ. — *Guaìacum officinàle* is a tree, a native of the West Indies, remarkable for the hardness of its wood. It has blue flowers, which are produced in succession all the summer. It requires a stove in England, and should be grown in a mixture of peat and loam. See **Guaiacum.**

Liguʹstrum. — *Oleàceæ.* — The Privet is one of the most common, but at the same time most useful, of garden shrubs. The plant, in its wild state in Britain, is deciduous; but there is a variety obtained originally from Italy, which is evergreen, and which forms hedges for shelter of every size, from those of six inches in width and one foot in height, to hedges ten feet high and two or three feet in width. These hedges afford an excellent shelter to exposed flower-gardens, and also when planted on the south side of a border, shady situations for particular kinds of plants, such as Primroses, Polyanthuses, the rarer kinds of Ranunculaceæ, Trilliums, Cypripediums, Bog Orchideæ, and a great variety of others. The Privet is preferable to all other plants for garden-hedges on account of the rapidity of its growth, and the nature of its roots, which are chiefly fibrous, and never extend to a great distance from the plant. The tree Box has the same properties, but then it is of much slower growth. The evergreen Privet is also one of the best plants for verdant architecture and sculpture; because it grows compact, is of a deep green colour, bears the shears well, and the leaves being small, they are not disfigured by clipping, like those of the Holly or the Laurel. The Box equals it in the smallness of the leaves, but it grows more slowly; and though the Juniper and Yew surpass it, because their leaves never show the mark of the shears, they grow much slower still. It is much to be regretted, that with the re-introduction of the French and Italian modes of laying out flower-beds, the verdant arcades, colonnades, and detached figures of obelisks, pyramids, cones, and figures of men and animals, are not re-introduced also; but as this will probably soon be the case for the sake of propriety and consistency of character, the Privet will then be found an invaluable shrub. It grows in any soil and situation, even in narrow courts amid coal-smoke, and it is readily propagated by cuttings. It also grows under the shade of trees, and is therefore admirably adapted for thickening and darkening narrow shrubberies and screening of plantations. As a single object, the Privet is very ornamental, whether covered with its white flowers or its dark-purple berries; and there are varieties with green, white, and yellow berries, and variegated leaves. ***Ligústrum lùcidum***, and ***L. spicàtum***, are very ornamental sub-evergreen shrubs or low trees, natives of China and Nepal; but they are liable to be injured by very severe winters. These two species are propagated by budding or grafting on the common Privet.

LILAC.—See SYRINGA.

LI'LIUM.—*Liliàceæ.* or ***Tulipàceæ.***—The Lily is a splendid genus of bulbous-rooted plants. All the species are beautiful, and most of them are hardy. ***Lilium cándidum*** grows from three feet to five feet high, and its pure white flowers which appear in June, are well-known from being placed by painters in the hands of the Virgin. ***L. bulbíferum***, a native of Italy, has orange flowers, which appear in June and July, and the plant is equally high with the preceding species. ***L. philadélphicum*** grows five feet or six feet high, and produces its fine scarlet flowers in August. ***L. Pompònium*** is a splendid species, with scarlet flowers, produced in May and June, and ***L. tigrìnum*** grows six feet high, and produces its black-spotted orange flowers in August and September. There are many other hardy species in cultivation; and ***L. exímium***, ***L. japónium***, ***L. longiflòrum***, and some others, eminently beautiful, and chiefly with white flowers, require the protection of the greenhouse, or a cold frame. The species which are natives of America thrive best in sandy peat, kept moist when the plants are in a growing state; but the others grow freely in common garden soil. They are all readily propagated by offsets, which they produce in abundance. The bulbs of all the species are probably edible when cooked, for those of ***L. Pompònium*** are used in Kamtschatka in the same way as potatoes are in Britain; and they all belong to what are called the scaly bulbs, which may remain several years in the ground without taking up, and which, when they are taken up, should be planted again as soon as possible.

LILY.—See LILIUM.

LILY OF THE VALLEY.—See CONVALLARIA.

LIMAX.—This is the scientific name for the slug, one of the most destructive creatures in existence for a garden. The slug differs from the snail in having no apparent shell, though it has the rudiments of a shell buried in the upper part of its body. Like the snail also, it can only crawl when the earth is moist with rain or dew: as when the ground is dry, it absorbs too much of the slime which both slugs and snails are obliged to discharge from their bodies to enable them to glide along. There are many kinds of slugs, nearly all of which are destructive to vegetation; the only exception being the shell-slug (*Testacella*), which lives on earth-worms. These creatures are by no means common; but they are found in the earth near hothouses, in the neighbourhood of London, and they may be known by their dirty yellow colour, and by their having a little scale-like shell, which naturalists call the shield or buckler, on the outside and on the highest part of the body, near the breathing-hole, which it is probably intended to protect. Slugs may be destroyed in the same manner as snails. See HELIX.

LIME.—A kind of Citrus, rarely grown in England, but requiring the same treatment as the orange and the lemon. See CI'TRUS.

LIMNA'NTHES.—*Limnantheceæ.*—One of the Californian annuals, the flowers of which are yellow in the centre, with a deep border of white. For the culture, see ANNUALS.

LIMNO'CHARIS.—*Hydrocharideæ*, or *Butomeæ.*—These plants, which are natives of Brazil, are either annual or biennial, and the seed should be sown in a layer of rich, loamy soil, at the bottom of a cistern or tub, which should be kept very moist; and as the young plants grow, the tub or cistern should be gradually filled with water. They require the heat of a stove.

LINA'RIA.—*Scrophularineæ.*—Toad-flax. Hardy annuals, that only require sowing in March, April, or May, in the open border. They will grow in any soil or situation; but they prefer a rather stiff, poor soil, and an open, exposed situation. Several of the kinds have been removed from the genus *Antirrhinum* (Snapdragon) to which they are very nearly allied.

LINNÆ'A.—*Caprifoliaceæ.*—A trailing plant, adapted for rockwork, or pots, as it is too insignificant in its appearance to produce any effect in the open garden. It should be grown in loam and peat, and it may be propagated by cuttings, which should be struck under a hand-glass.

LINUM.—*Linaceæ.*—The Flax. The common flax, the fibres of the stalk of which are used to make linen, has pretty blue flowers; but there are other species of the genus with showy yellow flowers. Some of the perennial kinds are rather tender, and require to be protected during severe winters; they are also liable to damp off if kept too moist. They should be grown in light soil, consisting principally of vegetable mould; and the dwarf kinds are very suitable for rockwork. They are generally propagated by cuttings or seeds, which they ripen abundantly.

LION'S-EAR.—See LEONO'TIS.

LION'S-TAIL.—*Leonòtis Leonùrus.*

LIPA'RIA.—*Leguminosæ.*—Dwarf greenhouse shrubs, with orange or yellow flowers, natives of the Cape of Good Hope. Many of the species are now called Priestleya. They should be grown in loam and peat.

Liquid Manure may be described as a decoction of any description of putrescent manures, such as stable-dung, pig's-dung, pigeon-dung, sheep's dung, &c. It may be used with great advantage in the kitchen-garden, but is seldom required in the culture of flowers; and indeed many of the finer kinds have been injured by it, though some few, such as the Hydrangeas, the commoner Pelargoniums, Chrysanthemums, Cockscombs, Balsams, Auriculas, &c., have been benefited. Liquid manure ought not to be applied to plants till they have attained a considerable degree of strength and vigour; and after it has been once used, it ought to be continued without intermission as a substitute for common water, till the plants have attained the wished-for degree of maturity.

Liquidamber. — *Amentaceæ.* — Though too large a tree to come within the scope of this work, it may be mentioned for its ornamental appearance when quite young, from the brilliant purplish-red assumed by its leaves in autumn. It is quite hardy, and will grow in any common garden soil.

Liquorice.—See Glycyrrhiza.

Liriode'ndron.--*Magnoliaceæ.*—The Tulip-tree grows to a still larger size than the Liquidamber; but it is very ornamental from its flowers, which somewhat resemble those of the Parrot-tulip, and its curiously-shaped leaves. It does not, however, flower till it has become a large tree. The seeds, which are imported from America, often lie two years in the ground before they come up.

Lisia'nthus.—*Gentianeæ.*— Ligneous, perennial, and biennial plants, natives of the West Indies; which require a hothouse or greenhouse in England. *L. Russelidnus* has handsome purple flowers; but they are not *so beautiful* as was at first supposed, and the species is neither hardy nor annual. All the species should be grown in a mixture of loam and peat, and they are all propagated by cuttings struck in sand, under a bell-glass.

Lisa'nthe. — *Epacrideæ.* — The plants should be grown in a greenhouse, in peat and sand; and they are propagated by cuttings of the tips of the shoots, like heaths.

Lissochi'lus. — *Orchidaceæ.* — One of the terrestrial Orchideæ from the Cape of Good Hope, which should be grown in peat and loam, and is propagated by dividing the roots. It is generally kept in a stove.

Li'ttæa, or Ly'ttæa.— *Bromeliaceæ.*—Handsome plants, nearly allied to Agave, with spreading leaves and long spikes of flowers. The fine plant, formerly known as ***Bonapartea juncea,*** is now called ***Lýttæa geminiflòra.*** They should be grown in sandy loam, and are increased by suckers from the roots.

Loam.—Clay is one of the primitive earths, of so close and compact a texture, as to be almost unfit for vegetation, unless mixed with some lighter material; but, combined with sand and decayed vegetables, it forms loam. What are called sandy loam, and yellow loam, are two kinds of soil very conducive to vegetation; and sandy loam is perhaps the best of all soils for a garden.

Loa'sa. — *Loasaceæ.* — Stinging annual and biennial plants, with showy flowers. The splendid climbing plant, ***L. laterìtia,*** or ***aurántica,*** is now discovered to be ***Caiophora punicea,*** the difference between the genera consisting in the Caiophora having a twisted seed-pod, while that of the Loasa is plain. The species are all nearly hardy, but they do best when raised on a slight hotbed, and planted out in May.

Lobe'lia.—*Lobeliaceæ.*—Nothing

can exceed the beauty of the plants retained in this genus, some of which are tender, requiring a stove, and others of which are quite hardy, growing freely in the open ground. Some also are quite dwarf, and others tall plants; some are blue, others scarlet, and others yellow; and some are annuals, and the others perennials. All the Lobelias require a light rich soil, and plenty of moisture. The large, tall-growing kinds, with scarlet or pink flowers, are now frequently called Tupa.

Loblolly Bay.—See Gordo'nia.

Locust Tree of the Americans, or Cobbett's Locust.--*Robinia Pseudo-Acàcià.*—See Robi'nia.

Logwood.--*Hæmatòxylon campechiànum.* — A leguminous stove-shrub, which grows best in loam and peat, and is propagated by cuttings.

London Pride.—*Saxifràga umbròsa.*—See Saxifra'ga.

Loni'cera.—*Caprifoliaceæ.*--The upright or fly Honeysuckle. Great confusion exists in botanical works respecting the scientific names of the different kinds of Honeysuckle. Generally speaking, however, the climbing kinds are called *Caprifòlium*, and the upright, erect shrubs, *Lonicera.* The latter kind are all quite hardy, and will grow in any common soil; and they are propagated by cuttings planted in the open ground in autumn. *L. tatarica*, the Tartarian honeysuckle, and *L. xylosteum*, the common fly honeysuckle, are the commonest kinds.

Loose Strife.—See Lysima'chia.

Lope'zia.—*Onagraceæ.*—Annual and biennial plants, hardy, half-hardy, and tender; but with light, feathery pink flowers, and pretty ball-like fruit, which is produced on long stalks, and is very ornamental. For the culture, see Annuals and Biennials.

Lophospe'rmum. — *Scrophularineæ*—Beautiful climbing-plants, with pink bell-shaped flowers, which grow luxuriantly in the open border, covering a trellis-work or a wall in an incredibly short space of time. As the plants are killed down to the ground in winter, cuttings should be taken off in autumn, and kept in a greenhouse or frame during winter to plant out in spring. The plants will grow in any common garden soil, provided it is tolerably light, and that they have abundance of space for their roots.

Loquat Tree.—See Eriobothrya.

Lora'nthus.— *Loranthaceæ.*—A kind of Miseltoe, generally found on the oak; common in Germany, but not yet introduced into England.

Lord Anson's Pea. — *Làthyrus Magellànicus.*—See Lathyrus.

Lotus.—*Leguminosæ.* — Birds'-foot Trefoil. Pea-flowered annual and perennial plants, generally with yellow flowers, but sometimes with white or pink flowers, some of which are only half-hardy. They are all grown in sandy loam, and are generally propagated by seeds.

Love Apple.—The Tomata. See Lycope'rsicum.

Love lies Bleeding. — *Amaranthus caudatus.*—See Amaranthus.

Lo'wea.—The new name for *Ròsa berberidifòlia.*

Lucu'lia.—*Rubiaceæ.*—*L. gratissima* is a remarkably fragrant plant, with large flowers, something like those of the Hydrangea. It is grown in a greenhouse, in a mixture of light turfy loam and peat; and it is propagated by cuttings, which require bottom-heat.

Luna'ria. — *Cruciferæ.* — Honesty. Hardy annual and perennial plants, which will grow in any common garden soil, and only require the usual treatment of their respective kinds. See Annuals and Perennials.

Lupine.—See Lupinus.

Lupi'nus.—*Leguminaceæ*.—The Lupine. A genus of herbaceous annuals and perennials which furnishes some of our most beautiful border flowers: yellow, blue, white, and pink Lupines, are among the oldest border annuals; ***L. nànus*** is a beautiful little annual, with dark blue flowers, a native of California, and requiring the usual treatment of Californian annuals. ***L. mutábilis*** and ***L. Cruikshánkii*** are splendid plants, growing to the height of four or five feet, and branching like miniature trees; ***L. polyphýllus*** and its varieties are perennials, and they are splendid and vigorous growing plants, with spikes of flowers from one foot to eighteen inches in length; ***L. Nootkaténsis*** is a handsome dwarf perennial, and ***L. arborèus*** when trained against a wall will attain six feet in height, and in sheltered situations it will grow with equal vigour trained as a bush tied to a stake; ***L. latifòlius*** is a perennial from California, with very long spikes of blue flowers. All the species will thrive in common garden soil; the annuals are propagated by seeds sown in February or March, and the perennials by division of the root.

Ly'chnis.—***Silenaceæ***, or ***Carophylleæ***.—Beautiful flowers nearly allied to the pinks; some of which, such as the Ragged Robin, ***Lýchnis Floscùculi***, grow wild in the hedges in England. They are nearly all hardy, and may be grown in any common garden soil.

Lycium. — ***Solanaceæ***. — Boxthorn. The species are mostly hardy shrubs with long slender shoots, which trail on the ground or ascend among the branches of larger shrubs or trees, according as they may be circumstanced. ***Lýcium barbarum***, the Duke of Argyle's Tea Tree, is one of the most vigorous growing hardy shrubs, producing when established a year in good soil shoots ten feet or twelve feet long; ***L. europæ'um*** is almost equally vigorous; and ***L. Trewiànum***, in a warm sheltered situation, will grow to the height of twenty feet. Scarcely any shrub will cover a bower, or naked wall, or trellis fence in so short a time, and the fruit, which is of a coral colour, is ornamental as well as the flowers. The species mentioned have only one disadvantage, which is, that their roots run to a great distance, and throw up numerous suckers; and this peculiarity renders the plants unfit for small gardens, though well adapted for confined court-yards or narrow passages; the side walls of which are to be covered with verdure. A single plant on a lawn trained with a stem to the height of ten or twelve feet, and then allowed to spread on every side over frame-work in the form of an umbrella, will not only cover this frame-work, but produce shoots which will hang down to the ground on every side, and thus form a complete curtain, which may be drawn aside like that of a window or bed, and will close again of itself on the spectator. These species are easily propagated by cuttings of the roots or shoots in any common soil rather dry than moist. ***L. afrum*** is a very beautiful species, with large violet-coloured flowers, but it requires the protection of a wall; and ***L. Boerhaaviæfolium***, recently changed to ***Grabówskia***, is remarkable for the singularity of its leaves, which are covered with a mealy whiteness; it also requires the protection of a wall.

Lycope'rsicum.—***Solanacea***. ***L. esculentum***, Dun. (***Solànum Lycopérsicum***, Ton.) the Tomato or Love-apple, is generally grown for its fruit, which is eaten as a sauce, &c. It is, however, very ornamental when the fruit is ripe, from its large size and brilliant colour. There are several kinds, varying in the size and the colour of the fruit. Nearly all the kinds are annuals, which should be raised on a hotbed, and planted out in May against a wall or espalier railing, to which they should be trained; they all require a rich soil, and abundance of sun and air to bring them to perfection.

LYCOP'ODIUM.—*Cryptogamia Lycopodineæ.*—Club-moss. A curious kind of moss, common in Europe and America, some of the kinds of which are very ornamental. *L. helvéticum*, which is very handsome, is generally grown in pots in green-houses. It should be grown in peat and loam, and allowed abundance of water.

LYSIMACHIA — *Primulaceæ.* — Loose-strife. Herbaceous plants with yellow flowers, chiefly perennials, and of which one species, *L. nummulària*, Money-wort, is a well-known ever-green trailer, which, when kept in a pot of moist soil will produce shoots of two or three feet in length, which hang down on every side. *L. verticillàtum* is an upright growing plant, with abundance of showy yellow flowers, which looks very well as a border flower in a large garden. They will grow in any common garden soil.

LYTHRUM.—*Lythraceæ.* A genus of very ornamental hardy perennials, which grow in any common soil kept moist, and are propagated by division. *L. salicària* is a native of Britain on the banks of rivers, and grows to the height of four feet; *L. diffùsum* grows to the height of one foot; and both these species produce their purple flowers in July and August, when flowers are comparatively rarer than they are in June and September. *L. virgàtum* grows three feet high, and produces its purple flowers from June to September.

LYTTÆA.—See LITTÆA.

M.

MACL'URA. — *Urticaceæ.* The Osage orange. Handsome ever-green trees, with small shining yellowish green leaves, and many thorns. The flowers are white and rather small, but the fruit, which is as large as an orange, and of a brilliant golden yellow, is very ornamental. These trees are as yet rare in British gardens, but they have borne fruit in the Jardin des Plantes in Paris. The male and female flowers are on different trees. It is supposed that the leaves of this plant will be equally good as those of the white mulberry for feeding silkworms, as they abound in a milky juice which is very tenacious. The Maclura succeeds better in rather a poor soil; as where the soil is too rich, the plant makes shoots more luxuriant than it can ripen; and thus the tops of the young wood are often killed by frost.

MADDER.—See RUBIA.

MADIA.—*Compositæ.*—*M. sativa* is a weedy-looking plant, grown in Germany, for crushing its seeds to make oil. *M. elegans* (*Madaria elegans*, Dec.) is a coarse growing annual, with woolly leaves, and very pretty yellow flowers, which are brown in the centre. The seeds should be sown in the open air in February, or as soon as the weather will admit, in rich deep soil; or in sheltered situations, the seeds may be sown in autumn, and the young plants left to stand the winter. When the plants begin to attain a considerable size, they should be staked and tied up, or they will have a very untidy and disagreeable appearance. The kind called *M. splendens* is only a variety of *M. elegans.*

MAGNO'LIA.—*Magnoliàceæ.*—This is a genus of singularly ornamental trees, mostly of small size, and some of them shrubs. *M. grandiflora*, the ever-green Magnolia, the most desirable variety of which is *M. g. exoniénsis*, is a well-known highly prized tree, generally planted against a wall. Though it will only flower freely in favourable situations, yet it is very hardy, not having been killed anywhere by the severe winter of 1837-8. In every villa, whatever may be its extent, one or two plants of this Magnolia ought to be placed against the house, or on a conservative wall. It requires a loamy soil, rather rich; but it will grow still better in peat, and it requires no attention but training the branches, and nailing them against the wall. It produces its large flowers, which are from six inches to a foot in diameter when fully expanded, from August to October. *M. g. præcox* is a comparatively rare variety, with broader leaves than *M. g. exoniénsis*, and still larger flowers, and they appear in July and sometimes in June. In purchasing both species in the nurseries, care should be taken to select plants which have been raised from layers; as seedlings, which are now sometimes imported from France, are often ten or fifteen years before they come into flower: whereas the others will flower the first or second year. *M. conspícua* is a deciduous tree, which produces abundance of white flowers about the size of lilies, in April and May, and sometimes even in March. It is quite hardy, but as its flowers appear so early, they are liable to be injured by spring frosts; they also appear before the leaves, and for these reasons the tree should be planted against a wall, and if possible near *M. grandiflora*, and the branches of the two intermingled, in which situation, it produces a splendid effect. It never grows out of bounds, and therefore requires no pruning. It will thrive quite well as a standard in any common soil, and planted among evergreens in sheltered situations forms a splendid object when in flower. *M. c. Soulangiàna* is a hybrid between this species and *M. purpùrea*, equally splendid in its flowers; and this hybrid, *M. conspicua* and *M. grandiflora*, ought never to be omitted in any garden whether small or large. *M. purpùrea* is a shrub which will thrive in the open border, but it flowers best against a wall, and no plant is better deserving a place there. *M. acumináta*, with bluish flowers, and *M. cordàta* with yellowish ones, are as hardy as most flowering trees, and the former will attain the height of thirty or forty feet in fifteen or twenty years; both deserve a place as standards. *M. auriculàta* is a beautiful hardy tree with mahogany-coloured bark and smooth shining leaves with reddish veins, it ought also to have a place in every collection of trees. The flowers of this and of the two preceding sorts are not fragrant like those of *M. grandiflòra* and *M. conspícua*. *M. tripétala* has leaves so large, that in America it is called the umbrella-tree; the flowers are white and fragrant. It requires a peat soil kept moist, and forms a splendid object on a lawn. *M. macrophylla* is a comparatively rare species with white flowers, the petals of which have a purple spot at the base, and the leaves are of an enormous size. It thrives best in this country in deep sand. *M. fuscàta* is a greenhouse shrub with brown coloured flowers delightfully fragrant; which well deserves a place in every conservatory, and which, in very warm situations, will live through the winter against a conservative wall. In general, the Magnolias may be designated the aristocratic trees of a garden, whether we regard the large size and fragrance of their flowers, or the length and breadth of their enormous leaves. The bark and wood of all of them are fragrant, and may be used as a substitute for those of the Cinchona.

Mahaleb.—The Mahaleb Plum or Cherry.—See **Cerasus.**

Maho'nia—*Berberideæ.*--The Ash Berberry. Very handsome evergreen shrubs, with pinnate leaves, and bearing abundance of brilliant yellow flowers, which are succeeded by black berries. All the kinds grow freely, and are very ornamental, but *M. Aquifolium,* the leaflets of which somewhat resemble the leaves of the holly, is by far the handsomest and hardiest species. They will grow in any common garden soil, and are increased by layers. *M. fasciculàris* and *M. repens* are rather tender, and should have some slight protection during severe frosts.

Maiden-hair.—See **Adiantum.**

Malachodendron. — *Ternstrœmiàceæ.*—A handsome bushy shrub, which may be trained as a low tree, with large white flowers. It should be grown in sandy peat, and it is propagated by layers or cuttings, the latter of which, however, require sand, a bell glass, and bottom heat, to make them strike root.

Malcòmia. — *Cruciferæ.* — The Virginian Stock. A pretty little annual which only requires to have its seeds sown at almost any season to grow, and to flower abundantly. As nearly all the seeds are sure to come up, it may be sown as an edging plant instead of box or thrift; and in fact it is often used for this purpose in cottage gardens.

Male Fern.—*Asplènium Felix-mas.*—A very handsome species of fern for growing in shrubberies.

Maleshe'rbia.—*Maleshérbiaceæ* —A very pretty Chilian half-hardy annual, with blue flowers, the seeds of which should be sown on a hot-bed in February, and the young plants planted out in May.

Mallow.—See **Malva.**

Ma'lope'.— *Malvaceæ.*—Annual plants with very handsome flowers. *M. trífida,* of which there are two kinds, one with crimson and the other with white flowers, is rather dwarf; but *M. grandiflora* will grow four or five feet high in a good soil and an open situation, bearing very large and showy brilliant crimson flowers. All the kinds are quite hardy, and only require sowing in March or April in the open border, and thinning out and transplanting when the young plants are three or four inches high.

Malpighia.--*Malpighiaceæ.*--The Barbadoes Cherry. A stove trailer, a native of the West Indies, which requires a stove in England. It should be grown in a light loamy soil, and it is propagated by cuttings of the ripened wood.

Malva.—*Malvaceæ.*—The Mallow. A great number of different species are grown in British gardens, tender, half-hardy, and hardy perennials and annuals. They are all of the easiest culture according to their respective kinds; and the hardy species may be grown in any soil and situation.

Mammillaria.—*Cactaceæ.*—Succulent plants, with almost globular stems covered with prickles, but without leaves; the flowers growing out of the stem without any stalk. These plants are natives of the high tableland of Mexico, where they are subject to very few variations of temperature; and they should therefore be kept in greenhouse heat all the year in England. In their native country they grow in rich loam, and therefore require a better soil in this country than the different kinds of Cereus and Echinocactus, which grow among calcareous rocks, in the mould formed by the deposition of vegetable matter in the fissures. By attending to these particulars the Mammillarias may be easily grown in any situations where they can be kept free from frost. When grown in a room, they should be allowed as much air as possible; and the dust which lodges among their spines should be frequently blown off with a small pair of bellows, but the plants themselves should never be watered overhead.

Manchineel.—See Hippomane.

Mandragòra.—*Solanaceæ.*—*M. autumnalis* Spr. (*Atròpa Mandragòra* L.), the common Mandrake, is a perennial plant, with purple flowers, resembling those of the Alkegéngi, or Kite-flower, respecting which many fabulous stories have been told, all of which have no other foundation than a supposed resemblance between the roots of the mandrake and the figure of a man. There are several species of Mandragora, some of which have white flowers, and others yellow: and they are all more or less poisonous, being nearly allied to the Deadly Nightshade, and having the same stupifying qualities. They grow best in calcareous, or a sandy soil.

Mandrake.—See Mandragora.

Manettia.—*Rubiaceæ.*— Climbing plants, some of which require a stove in England; though one species, *M. cordifolia* Hook. (*M. glàbra* Dec.), which has very handsome bright scarlet tube-like flowers, is generally grown in a greenhouse. It is a native of Buenos Ayres, whence it was introduced in 1831, and, like many plants from that country, it will very probably stand the summer in the open border in England. It should be grown in a mixture of sandy peat and loam; and when kept in a pot, it should be allowed plenty of room for its roots, and abundance of fresh air as often as possible. It is propagated by cuttings, which must be struck in sand, with bottom heat.

Mangi'fera.—*Terebinthaceæ.* — The Mango Tree. A native of both the East and the West Indies, with white flowers, which requires a stove in England. The fruit is said to be of remarkably fine flavour in its native country. The plant in England should be grown in very sandy loam, and the pots well drained, as it is very apt to damp off.

Mango Tree.—See Mangifera.

Mangosteen. — *Garcínia Mangostàna.* — This celebrated fruit, which is so highly spoken of by travellers in Java, &c., belongs to the same genus as the Gamboge tree, and both require a stove in England. They are, however, very seldom grown in this country.

Mangrove.—*Rhizóphora Mangle;* a tree a native of the East Indies, and some parts of Africa, growing in marshy places, and seldom found in England.

Ma'nihot.—See Ja'tropha.

Mantisia. — *Scitamineæ.* — *M. Saltatoria,* the Opera Girls, is a plant, the flowers of which appear before the leaves, and which really look something like dancing figures fantastically dressed. The plant requires a stove in England, and it should be grown in a mixture of turfy loam, peat, and sand, kept rather moist, but well drained. It is increased by dividing the root.

Manures, in Floriculture, are little wanted, and in general leaf-mould, or hotbed dung, or any kind of fermentable material, consisting chiefly of vegetable matter, is to be preferred. See Leaf Mould. Thoroughly decomposed stable-dung is produced by turning it over every three or four weeks in summer, when fermentation is active, or three or four times in winter, when it is more slow; and in either case it is fit for use when it can be passed through a coarse sieve. It is to be mixed with the soil in proportions dependent on the nature of the plant to be cultivated. In general, rapid-growing plants, such as bulbs of every kind, require the roughly-decomposed manure; but strong vigorous plants which grow all the summer, such as Dicotyledonous annuals and perennials, may be manured with materials in a less decomposed state. All manures should be preserved in compact masses, so as to present as small a surface to the action of the atmosphere as possible, and a shaded situation is consequently preferable to one exposed to the free action of the sun and air.

Mara'nta.—*Cánneæ.*— The Indian Arrow-root. Stove plants, with tuberous roots and small white flowers. The Indian arrow-root is made from the tubers.

Mare's-tail.—See Hippu'ris.

Ma'rica.—*Irideæ.*—Fibrous rooted plants, with very ornamental flowers, greatly resembling those of the Cape bulbs. Natives of Africa, some of which require a stove and others a greenhouse in England. For culture see Amaryllis.

Marigold.—See Calendula.

Marjoram.—See Origanum.

Marrubium. —*Labiatæ.* — Horehound. The species should be grown in light rich soil; and they are increased by dividing the roots.

Marsh Mallow.—See Althæa.

Marsh Marigold.—*Caltha palústris.*—A British marsh or aquatic plant, sometimes introduced in ponds, and other artificial pieces of water, in garden scenery, to give them a natural appearance, or to hide their termination. The plants only require to be planted in the muddy banks of the water, if it be a pond; but if it be a river, they should have a stone or two laid on their roots to prevent them from being washed away by the stream.

Marsh Plants are of different kinds: those which grow in common soil, saturated with moisture throughout the year; those which grow in soil saturated or covered with water during winter and spring; and those which grow in peat-bogs. A few of them are ornamental; such as *Menyánthes trifoliàta* and *Comàrum palústre*, which are proper Marsh Plants; *Damasònium vulgàre*, and *Ranunculus língua* and *flámmula*, which grow in soils sometimes dry during summer; and *Parnassia palústris*, which grows in peat-bogs and springy soils. In gardens, bogs are easily imitated, by placing the soil in pots, or sunk boxes, with retentive bottoms and sides so as to retain water. Where there is an aquarium, or pond for plants, it is very common to have it surrounded with a border or margin of soil raised a few inches above the level of the water in the pond, and which is kept moist by the exudation of the water. To prevent the exudation from extending further than the border, the bottom and the outer margin are formed of masonry lined with clay. A very common mode and one of the best is, to place the plants in pots or tubs, and set these on supports in the water, so that the bottom of the pot or tub may be only a few inches covered by it. In this way the soil about the plant is kept sufficiently moist without the risk of any excess. Among Marsh Plants may be reckoned the different kinds of Sedge, some of which are very ornamental (see Ca'rex); the Buckbean (see Menya'nthes); *Hottònia palústris;* the Sweet-scented Rush (*Acorus cálamus*); the Forget-me-not (*Myosòtis palústris*); the Marsh Bedstraw (*Gálium palústre*); and many others.

Martagon Lily. — Those lilies which have the segments of the perianth so completely turned back, as to form no bad representation of a Turk's cap. In the midland counties these flowers are called Turn-again-gentlemen. For their culture see Lilium.

Martynia. — *Pedalineæ.* Half hardy annuals, with very oily seeds, which require to be raised on a hotbed, but which may be planted out in May.

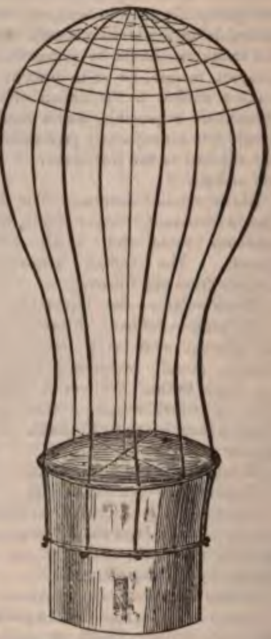
Marvel of Peru.—See Mirabilis.

Mastic Tree. A kind of Pistacia tree, producing the gum mastic.

Mathiola. — *Cruciferæ.* — The Ten-week Stock is an annual which should be raised on a hotbed, and transplanted into a very rich sandy loam in May. The remains of celery trenches which have been grown in a sandy or calcareous loam form the best soil for Stocks of all kinds ; but where this kind of soil cannot be obtained, sand or chalk, enriched with vegetable mould, will do extremely well. The finest Stocks I ever saw were in a garden at Greenhithe, the soil of which was chalk, and in Mrs. Humphrey's garden at Shenstone, the soil of which was a loamy sand ; and though both these were biennial Stocks, the same soil would have grown the annual ones equally well. Some of the finest Stocks in British gardens are from seed raised in Germany and Russia ; and the plants raised from this seed are called German and Russian Stocks. For the culture of the biennial species, see Brompton Stocks.

Maura'ndia. — *Scrophularineæ.* Elegant climbing plants, with beautiful dark-blue or purple flowers, which are rather tender, and are generally killed in winter, if planted in the open ground. They do not require much room for their roots ; and generally flower best in a pot, as their roots are so weak and delicate as easily to be killed by having coarse-growing plants near them. *M. Barclayana* thrives best in a pot with wires fixed in the rim for it to run over (see fig. 22); and thus treated, it forms an extremely beautiful object in a balcony garden. All the Maurandias should be grown in the light rich soil; and they are increased by seeds or cuttings.

Fig. 22.



Maxillaria.--*Orchidaceæ.*--A very extensive genus of Epiphytes, some of which have their flowers hanging down from the roots, and are grown in baskets of moss, the husks of cocoa-nuts, or on pieces of wood with the bark on, or hung by wires to the rafters of the damp stove or orchideous house. Some of the species have upright flower-stems, and are grown in pots in brick rubbish, mixed with sand or heath-mould, and a little loam. Most of the kinds are handsome, and some have splendid flowers.

May Apple. See Podophy'llum.

Maytenus. — *Celastrineæ.* —An evergreen shrub, a native of Chili, with yellowish flowers, which are produced in great abundance in May. It is nearly hardy, and only requires a slight protection during severe frosts.

Mecono'psis.—*Papaveraceæ.* The new name for the Welsh Poppy, *Papaver cambrica* L. This plant, which has yellow flowers, is a native of mountainous places in Wales; and it is of easy culture in any soil which is poor rather than rich.

Medica'go.--*Leguminosæ.* Weedy-looking plants, with yellow pea-flowers, which are generally single or in small clusters. The seed-pods of many of the species are very curious, some resembling snails, others hedgehogs, and others beehives. In old seed catalogues these names are all found enumerated; but they are omitted in those of the present date, as the plants to which they belong are found not worth growing.

Melaleuca.—*Myrtàceæ.*--Australian shrubs, with very singular tassel-like flowers, which the first settlers in New Holland called the tea trees, and which are nearly allied to Metrosideros. One species, *M. nereifolia*, which has yellow flowers with petals, has been removed to the genus Tristania; *M. Cajuputi*, from which the Cajeput oil is made, and *M. Leucadendron*, the black and white tree, are natives of the East Indies, and require a stove in England, but all the Australian species are green-house plants. One of the handsomest of these, *M. fúlgens*, has its flowers in a long spike, which looks like a bottle-brush. All the kinds should be grown in a compost of sand, loam, and peat; and they are all propagated by cuttings.

Mela'nthium.—*Melanthaceæ.*— Pretty little plants with bulbous roots and blackish flowers, mostly natives of the Cape of Good Hope, and requiring the usual treatment of Cape bulbs.

Melastoma.--*Melastomaceæ.* Very handsome stove shrubs, with large showy flowers. The leaves are also large and strongly ribbed. The fruit is eatable, and filled with a black pulp; whence the name of Melastoma, or Black-mouth, is said to be given to it, because it stains the mouths of those who eat it. All the species are natives of Ceylon and other parts of the East Indies; and they all require to be grown in peat, and kept rather dry during winter.

Melia.—*Meliaceæ.* — The Bead Tree. *M. Azedarach*, the common Bead Tree, is a half-hardy shrub, or low tree, with lilac flowers and yellow berries, the pulp of which is poisonous; but the hard stone in the centre is used to make rosaries. There is another species, *M. sempervirens*, which is a native of the West Indies, where it is called the Indian Lilac, or Pride of India. Both kinds are generally kept in the stove in England, where they will ripen their seeds; but the first kind does very well against a conservative wall, and it has flowered in the open air at Bayswater, and other places. It will grow best in loam and peat, and it is propagated by cuttings.

Melianthus. — *Rutaceæ.*— The Honey-flower. A half-shrubby green-house plant, with bluish green, or rather grey, leaves, sometimes called Sicilian Ragwort. If planted in the open air, and slightly protected from frost, it will grow ten feet high, and produce its large spikes of brownish red flowers abundantly. It is a native of the Cape of Good Hope. It should be grown in light rich soil, if it be wanted to attain a large size ; or in sand, mixed with a little loam and lime rubbish, if it be wanted to flower while yet of a small size. It looks very well trained against a south wall.

Meli'ssa.—*Labiatæ.*—The Balm. None of the species are particularly ornamental, but they are worth growing for the fragrance of their leaves. They are all hardy perennials, which will grow in any soil or situation, and which are propagated by dividing the roots.

Meloca'ctus. —*Cactaceæ.* — The Melon Thistle. All these plants have a sort of crown of cottony substance, which sometimes grows to an enormous size. The flowers are generally red, and are produced around this crown. They are natives of the hottest part of the tropics, and should be kept in a dry stove in England. They should be grown in a little sandy loam, mixed with two-thirds of lime rubbish ; and the pots in which they grow must be well drained with cinders, as they are very liable to damp off or rot, if any stagnant water be suffered to remain about the roots. They are very much improved by plunging the pots in which they grow into tan, and thus affording the plants bottom heat.

Melon Thistle. See Meloca'ctus.

Menispe'rmum. — *Menispermàceæ.*— Handsome climbing shrubs, natives of Europe and North America, with curiously-shaped leaves, racemes of yellowish or greenish white flowers, and red or black berries, which have somewhat of an intoxicating quality. *M. canadénse*, which is the commonest species, is a hardy free-growing climber, admirably adapted for covering a wall or arbour in a very short time, and in a very ornamental manner. It is well deserving of general *cultivation*, and yet it is comparatively little known ; perhaps on account of the modest colour of its elegant little drooping racemes of flowers, which are generally hidden from common observers by the leaves. Its English name of Moonseed is derived from the shape of the seed, which resembles a crescent or half-moon. It will grow in any soil or situation ; and it looks very well on a lawn trained up a single pole, and with the extremity of its branches left to spread themselves to the wind at pleasure. It also looks very well trained to form a pillar, or to a frame with an umbrella top, &c.

Menya'nthes.—*Gentiàneæ.* The Buck-bean. The European kinds have white flowers, but some of the exotic species, now called *Villarsia*, which are natives of Australia and the Cape, are very handsome, with very showy yellow flowers. They are all marsh plants, and should be sown or planted in the mud or soft ground left by the water. Some of the kinds are only half-hardy.

Menzi'esia.—*Ericaceæ.* — Little heath-like plants, formerly included in the genus Erica, natives of Europe and North America. The commonest kind, (*M. polifolia*) St. Daboec's heath, is found wild in Ireland. The flowers are larger and more globular than those of the common heaths, and much handsomer. They are quite hardy, and only require to be grown in sandy peat, or heath-mould.

Meadow Saffron.--See Colchicum.

Mesembrya'nthemum. —*Ficoidaceæ.*—The name of Mesembryanthemum is derived from *mesembria*, mid-day, and *anthos*, a flower ; and this name admirably expresses the habit of the plants, their flowers only expanding in the brightest sunshine. The English name of Fig Marigold alludes to the fruit, which is shaped like a fig, and which is eaten by the

Hottentots; and to the flower, which resembles that of a marigold in shape, and sometimes in colour. There are two kinds of Mesembryanthemum which are called the Ice-plant—viz., *M. glaciale*, and *M. crystallinum*, the former being an annual, and the latter a biennial—and they take their English name from the little globular protuberances, or rather blisters (which botanists call papulæ), filled with a soft watery matter, which glisten over the whole of the plants, and make them look as though they were covered with ice. The flowers of these plants are white; but there are other Mesembryanthemums with pink or purple flowers, and those of the commonest and hardiest kind, *M. pomeridianum*, are of a brilliant yellow. This kind is an annual, the seeds of which should be sown on a hotbed, and the young plants transferred to the open ground in May; and they should be always planted out into the open border, as they never flower well in a pot. The perennial kinds may be grown either in pots, or in the open ground; but in the latter case they should either be taken up or carefully protected during winter, as they are killed by the slightest frost. They should be grown in sandy or gravelly soil, which, for the larger-growing species, may be mixed with a little loam: but even of these, the poorer and more sandy the soil, the more brilliant will be the colours of the flowers, though the leaves and stems will become small and weak. All the species should be kept quite dry when in a dormant state, and abundantly supplied with water when they are about to flower; and all the perennial kinds are propagated by cuttings, which should be kept quite dry for several days after they are put into the ground, till they begin to wither, when they should be supplied with a little water, and they will directly begin to throw out roots. The pots in which these plants are grown should be well drained with cinders; and when planted out in the open air, it should be on a dry, open, sunny bank.

Me'spilus. — ***Rosàceæ.*** — This is one of those genera which have been dismantled, and almost annihilated, by modern botanists. A few years ago, and almost all the flowering-shrubs and low trees, included in the order Rosaceæ, were referred to Mespilus. All the Cratæguses, a great number of the Pyruses, the Aronias, Amelanchier, Eriobotrya, and many other allied genera, were all considered to belong to Mespilus. Now, however, the genus Mespilus is confined to the two kinds of Medlars; and even of these, *M. grandiflòra* seems rather doubtful. *Méspilus Germánica*, the common Medlar, and its varieties, are now, therefore, the sole support of this once extensive genus; and they are not only trees of considerable size, but trees that, notwithstanding their large white blossoms, are too coarse-growing to be called ornamental.

Metroside'ros. — ***Myrtaceæ.*** — Australian and Cape shrubs, with tassel-like flowers, nearly allied to Melaleuca. One species, (*M. vèrus*) the Ironwood, is a tree, and a native of the East Indies. The most beautiful of the Australian shrubs formerly considered as belonging to this genus, are now removed to the genus Callistèmon; and these have generally crimson flowers. The remaining species are generally kept in a greenhouse in England, but they may be grown in the open air, if they are slightly protected during winter; and in sheltered situations they will indeed often stand several years without any protection whatever. They should be grown in a mixture of sandy loam and peat, but any common garden soil will do; and when grown in the open air, they should be trained against a wall. They are propagated by cuttings of the ripened wood, which cannot be struck without the help of sand, bottom-heat, and a bell-glass.

Mignionette.—*Réseda odoràta.*—This well-known plant is generally considered as an annual, and sown every year as such; but it is, in fact, a shrub, and if preserved carefully through the winter, in two or three years its stem will become quite woody. In this state it is called the tree Mignionette, and is supposed by many to be a different species. It is a native of Barbary, and grows wild on the sandy shore of Algiers. The name of Mignionette, which is French for "the little darling" is supposed to have been given to it on account of its seeds having been first sent to England from Paris. It is rather singular, however, that it should be known by a French name in England, while in France it is called by its Latin name of Reseda.

Mignionette should always be sown in light, sandy soil, if possible; as, when grown in a rich loam, it loses its fragrance. With a little management, it may be contrived to have Mignionette in flower every month during the year without the aid of either a regular gardener or a hothouse. In order that the plants may flower in winter, the seed should be sown in the open border in July. Or, if it be more convenient, the seeds may be sown in pots in that month, placing the pots in a balcony, outside a window, or in any situation where they will have abundance of light and air. In September, the plants should be removed to the pots in which they are to flower, and only a sufficient number left in each to make the pots look full without the plants being so crowded as to occasion them to be drawn up. This number must, of course, vary according to the size of the pot; but it should never exceed eight, or be less than three. The pots should then be taken into the house, and placed in any convenient situation in a room without a fire, till they have formed their blossom-buds, which will be the latter end of October, when they should be removed to a window in a room where there is a fire; when they will throw out abundance of branches, and will continue flowering beautifully during November, December, and January; and, if they are regularly watered every day, till the following March. The seeds of the plants which are to come into flower in March to succeed them, should be sown in pots at the latter end of August, and the pots may be placed in a spare bedroom, or in any open shed, or other situation under cover, where they will have plenty of light, and can have air occasionally. Early in November they should be thinned out, or transplanted, so as to leave only six or eight plants in a pot, and these pots should be plunged into a shallow box or packing-case, half filled with coal-ashes, and placed in a cellar, or back kitchen, or, in short, any place where they will not have much heat, and yet be protected from frost. While in this situation, they should be regularly watered once or twice a week; and as no light is better than only a little, they may be covered with a piece of old carpeting, or an old ironing-blanket, supported by a few sticks stuck in the earth, so as to prevent it from crushing the plants by its weight. In this situation, though they will become quite blanched, they will grow freely, and be well-shaped plants; while, on the contrary, if they had not been covered, as they could not be put in a window on account of the danger from frost, they would have become etiolated, or drawn up, with weak, ill-shaped stems, in the efforts they would have made to reach the light. Besides, the blanket will save them from being injured by frost. About a fortnight before they are wanted to flower, the blanket may be taken off, and the box removed to the window of the kitchen, or some place where there is a constant fire; when the plants will soon become quite green, and will form their flower-buds. The pots may then be taken out of their box, and removed to the room where they are to flower, having been first put into other pots, somewhat larger than themselves, and the interstices between the two being stuffed with moss, which may also be laid on the surface of the earth in the inner pot ; or if moss cannot easily be obtained, double pots will suffice, the outer one being only just large enough to admit the inner one. A third crop may be sown in February, in pots, which may be kept under shelter till all danger is over from frost, and which may be then set out on window-sills, or in any other situation in the open air, and which will flower in May, June, and July, continuing in flower till they are succeeded by a fourth crop sown in April, in the open ground, or in pots in the open air, which will come into flower in July, and continue till November.

When it is wished to obtain a plant of tree mignionette, a healthy vigorous plant of mignionette sown in April, should be placed at the proper time for transplanting, in a pot by itself, and the blossom buds should be taken off as fast as they appear. In autumn, all the lower side shoots should be cut off, so as to shape the plant into a miniature tree, and it should be transplanted into a larger pot, with fresh soil, formed of turfy loam broken small, but not sifted, and sand. It should then be removed to a green-house, or warm room, and by being regularly watered every day, and kept tolerably warm, it will remain in a growing state all the winter, and by spring its stem will begin to appear woody. It should be treated in the same manner the following year, all the side branches being cut off as they appear, except those that are to form the head of the tree ; and by the third spring it will have bark on its trunk, and be completely a shrub. It may now be suffered to flower, and its blossoms, which will be delightfully fragrant, will continue to be produced every summer, for a great many years in succession.

Many persons save their own seed of the common mignionette, but it is hardly worth while to do so ; as it is generally both good and cheap in the seed-shops.

Mildew.—Rose-trees and many other plants are very apt to be affected in autumn, with a white or brownish appearance on the leaves, which is sometimes called the blight, but more properly rust or mildew. The cause of this appearance was long unknown ; and some supposed it to be produced by unhealthy winds, and others that it was the work of insects ; it is now however satisfactorily proved to be a parasitic plant or fungus growing on the leaves, as lichens and other fungi grow on the bark.

The parasitic fungi known by the general name of mildew are of three kinds : viz., those that grow on the surface of the leaf, those which form under the epidermis or outer skin, and those that attack the root. The first kind may sometimes be removed by abundant watering ; which not only gives vigour to the plant, but actually tends to loosen the hold the fungus has taken of the leaves ; but the second kind can only be stopped in its career by the removal and burning of all the infected leaves; and the third generally occasions the death of the plant. The different kinds of Uredo (from *uro*, to burn or scorch), which looks as though the under side of the leaves were covered over with a brown powder; and the different kinds of Æcidium which rise like pimples over the leaves, and burst when ripe, are the most destructive. The smut which attacks the corn crops belongs to the first of these genera, and the barberry mildew to the last. The root mildew generally attacks bulbs; and when the crocus is cultivated for saffron, sometimes the entire crop is thus destroyed. Many remedies for mildew have been recommended, but none can be depended on; and the best means of preventing its appearance, seems to be keeping the plants in a state of vigorous growth; as it is generally found only on such plants as do not appear to have had sufficient strength to resist its attacks.

Milfoil.—See Achille'a.

Milkvetch.—See Astra'galus.

Milkwort.—See Poly'gala.

Mi'lla.—*Asphodèleæ.*—A Mexican plant, with flowers of the most brilliant and purest white, which continue expanded day and night, till they fade; instead of closing at night, as is usual with plants of the same family. They will grow in any common soil, and only require a slight protection from frost, such as covering with dead leaves &c. during winter.

Milt'onia. — *Orchidàceæ.* — A very beautiful epiphyte from Brazil, with its flowers on erect stems, like those of the Cattleya, which this plant somewhat resembles. Though an epiphyte, it is generally grown in England, in a pot, in loam mixed with sand and rubbish, and it requires the same treatment as other orchideous epiphytal plants, which will bear being grown in pots.

Mim'osa. — *Leguminòsæ* — To this genus belongs the Sensitive plant, of which there may be said to be three species, the leaves of all of which shrink to the touch, viz., *M. sensitìva*, a native of Brazil, growing about one foot high, with pale ball-like pink flowers, *M. pùdica*, a native of Brazil, growing about one foot high with white flowers, and *M. cásta*, a native of the East Indies, growing about two feet high, with pale yellow flowers. *M. pùdica* is the sensitive plant most cultivated in green-houses; though *M. sensitìva* is also very generally cultivated; the former however is a shrub, and the latter an annual or biennial. Both may be raised on a hotbed in spring, with the tender annuals; and either kept in pots throughout the summer, or turned out into the open border about the end of May. Many species formerly included under the genus Mimòsa, are now removed to Acàcia; the principal distinction between the genera, being that Mimòsa has a jointed seed-pod, which Acàcia has not. Several other genera have also been formed out of Mimòsa. Some of the kinds are stove plants; others thrive in a green-house; and *M. marginàta* Dec., the *M. prostràta* of the nurseries, is sufficiently hardy to stand ordinary winters against a conservative wall. They should be all grown in a mixture of loam and peat; and they are propagated by seeds or cuttings.

Mi'mulus. — *Scrophularíneæ.*— The Monkey-flower. The first Mimulus introduced into Britain was *M. ríngens* in the time of Miller; and *M. glutinòsus*, a shrubby species with orange flowers, was the second. Since then numerous species have have been introduced from North and South America, annuals and perennials, and one other shrub. All the herbaceous kinds of Mimulus cross freely with each other, and thus a great number of showy plants have been raised. They should all be grown in a compost of peat and loam, and supplied abundantly with water; indeed when grown in pots, they should be kept constantly standing in saucers full of water. They are all very nearly hardy; and *M. ròseus*, *M. cardinàlis*, and *M. moschàta*, will grow in the open air for several years without any protection, dying down to the ground in winter, and springing up and flowering abundantly every spring. The shrubby kinds are now separated from the others, and formed into a new genus under the name of Diplacus. (See **Diplacus.**) The name of Monkey-plant alludes to the seeds, which are marked so as to bear some resemblance to the face of a monkey.

Mira'bilis. —*Nyctagineæ.*—The Marvel of Peru. These plants, though generally treated as annuals, have fusiform tuberous roots, which may be taken up every year and replanted, like those of the Dahlia. They require a rich soil.

Mirabe'lia.—*Leguminòsæ.*— An Australian shrub, with pretty pea-flowers; which is generally kept in a greenhouse in British gardens. See **Australian Shrubs.**

Mistletoe.—See **Viscum.**

Moldavian Balm. — See **Moluccella.**

Molucce'lla.--*Labiàtæ.*--A hardy annual, which only requires sowing in March or April in the open border, in any common garden soil. See **Annuals.**

Moly.—A kind of garlic, with very pretty yellow flowers. See **Allium.**

Momo'rdica. — *Cucurbitaceæ.* — The Squirting Cucumber. An annual gourd-like plant, with woolly leaves, and yellow flowers, the fruit of which resembles a small cucumber; and which, when ripe, bursts the moment it is touched, scattering its seeds, and the half liquid, pulpy matter in which they are contained, to a considerable distance. This quality made it a favourite in gardens a century ago, when some people were yet in a state of sufficient barbarism to find amusement in the annoyance of others; but it has now deservedly fallen into disrepute, and is seldom grown.

Monoca'nthus. — *Orchidaceæ.*— The Monk Flower. An orchideous epiphyte from Demarara and Brazil, requiring the usual treatment of similar plants. See **Orchideous Epiphytes.**

Mona'nthes. — *Crassulàceæ.* — Mr. Haworth's name for *Sempervìvum Monanthes*, a kind of houseleek with red flowers, from the Canary Isles. See **Sempervivum.**

Mona'rda. — *Labidtæ.* — Hardy herbaceous plants, with showy flowers, natives of North America; they grow best in a rich light soil, and they are increased by dividing the root.

Money Wort.—*Lysimàchia nummularia.* — A trailing plant, with yellow flowers, which should be grown in peat, or some other light soil, and kept moist. Its long trailing shoots look very well hanging over the sides of a rustic basket or vase, supported on a pedestal, or on rockwork; and in such situations, if kept moist, they will flower abundantly; while the same plant removed into the shade, will not produce a single flower, and is easily killed if watering be neglected.

Monkey Flower.—See **Mimulus,** and **Diplacus.**

Monk Flower. — See **Monocanthus.**

Monkshood.—See **Aconitum.**

MONOCHLAMYDEÆ.—Plants having only a calyx and no corolla; in opposition to DICHLAMYDEÆ, which are the plants which have both a calyx and a corolla.

MONOCOTYLEDONOUS plants are those, seeds of which send up only one cotyledon or seed-leaf when they vegetate; and have leaves, the veins in which are in parallel lines. The ligneous, or woody plants belonging to this division increase very little in thickness during the whole period of their existence; and their wood consists of fibrous matter, fresh quantities of which are deposited every year within the stem. See ENDOGENS.

MONŒCIOUS plants are those which have the male and female flowers separate; but still on the same plant; while DIŒCIOUS plants are those that have the male and female flowers distinct, and on different plants.

MONO'PSIS.—*Lobelidceæ.*—A very beautiful little trailing plant, having dark blue flowers with conspicuous yellow anthers, and the flowers on long foot-stalks. It is a native of the Cape of Good Hope, and it should be grown in sandy peat. It is suitable for rockwork.

MONSONIA.—*Geraniaceæ.*—Very beautiful herbaceous plants, nearly allied to the Geraniums, but with much larger flowers, and named in honour of Lady Anne Monson. They are now rarely seen, but well deserve cultivation. They should be grown in a mixture of vegetable mould and loam, and kept in a greenhouse. They are propagated by cuttings, or dividing the roots. They are natives of the Cape of Good Hope.

MOON-SEED.—See MENISPE'RMUM.

MOON TREFOIL.—*Medicago arbórea.*—See MEDICAGO.

MOOR HEATH.—See GYPSOCALLIS.

MORÆA.—*Irideæ.*—Bulbous-rooted plants, with very handsome flowers. nearly allied to Ixia, from which genus they have been removed. They are generally grown in pots in a mixture of sandy loam and vegetable mould; and when they have done flowering they should be kept dry till they begin to grow in spring. When planted in the open ground, they should be protected from frost and heavy rains.

MORICANDIA. — *Cruciferæ.* — A very pretty hardy annual, which should be sown in the open border in March or April.

MORMOD'ES. — *Orchidaceæ.*—An orchideous epiphyte, with dark purple flowers, from the Spanish Main. It should be grown on a piece of wood. See ORCHIDEOUS EPIPHYTES.

MORNA.—*Compositæ.*—Beautiful half-hardy annuals, with everlasting flowers, which should be raised on a hot-bed, and planted out in May.

MOSSHOUSES are constructed of wood lined with rough boards, to which moss, either of one or of different kinds, is attached by cord or wire, and nails. The roof is also covered with boards, to which is fixed sometimes thatch, and at other times heath, or the mossy bark of oak, pine, birch, or other old trees. The floor is generally paved with blocks of wood, or sometimes with small pebbles, or any other material, according to fancy. The ceilings are generally lined with moss in the same manner as the side walls, and both may be formed into pannels according to the taste of the designer. There are a great many kinds of moss and lichens which may be used for lining mosshouses. Of terrestrial mosses, those which are most common are the *Dícranum glaúcum*, which is of a whitish green, and *Brỳum hórnum*, which is of a yellowish green; *Sphágnum acutifòlium* is of a pinkish colour, and *S. obtusifòlium* is of a yellowish white. The common tree mosses, or technically lichens, are *Cenómyce* *rangiferina*, the reindeer moss, which is found on the ash, and on many other trees, and is white. This moss also grows in great abundance on poor gravelly soils among heath, for example, on Bagshot Heath.—Near London any quantity of the green moss, and also of the yellow kind, may be purchased in Covent Garden market; and the reindeer moss, if ordered from local nurserymen adjoining heaths, may be collected by the same persons who supply them with the other mosses. Almost everything in an affair of this kind must be left to the fancy of the designer. Some of the handsomest mosshouses in England have been erected in Bagshot Park, the seat of the Duchess of Gloucester, by Her Royal Highness's very intelligent gardener, Mr. Toward. Mosshouses must not be confounded with roothouses, which are formed with fantastic roots, or with woodhouses, which are formed with branches of trees with the bark on. When a mosshouse is to be erected, the first thing to be done is to make a drawing of the effect that it is intended to produce, and then to prepare the frame. If the mosshouse is to be only a kind of alcove open in front and without windows, it will be easy to get some wood, and any man-servant who can use a saw and a hammer can put it together; but if it is to have a door and windows, a regular carpenter must be called in. In the first case, young pine and larch trees that have been cut down in thinning plantations, will do very well. When the framework is completed, lathes must be nailed across the compartments, between which the moss is thrust with a wooden knife, or blunt chisel, the root end being lowest. The great art consists in arranging the moss so as to form a pattern; and this is accomplished by sorting the moss into heaps of the different colours, tracing the pattern rudely on the lathes, and keeping a coloured copy of the design before the operator. The moss should be so contrived as completely to hide the lathes, and it should also be pushed in to a sufficient depth to be quite firm. The lines of the figure should be quite distinct, and the colours clear, and well contrasted.

Mould.—Thoroughly decomposed leaves or putrescent manure, mixed with sand or other light soil, is called mould, which is chiefly distinguished from soils by its containing but a small portion of earthy matter: hence we have leaf mould, composed chiefly of rotten leaves; dung mould, of dung reduced to a dry powdery matter, and heath mould, consisting of the black vegetable soil found on the surface of heaths, and always more or less mixed with sand. The two first kinds of mould are used for growing plants which in cultivation are considerably removed from a state of nature, such as Pelargoniums, China Roses, Fuchsias, Balsams, Petunias, and a great many others; and the heath mould is used in the culture of heaths and of Ericàceæ, and more or less in most New Holland and Cape shrubs, and in bulbs. In general, all plants whatever, from the oak to the moss, will grow in heath mould alone, and therefore it is a particularly useful soil in which to raise seedlings; and in this respect it differs materially from leaf mould and dung mould, in which they will not grow. Garden mould is composed of decayed vegetables and manure, mixed with the finer part of the soil, thoroughly pulverized by repeated digging, raking, and hoeing.

Mountain Ash.—*Pyrus aucuparia.*—A well-known tree, very ornamental in shrubberies for the abundance of red berries with which it is covered every autumn. It is quite hardy, and will grow in any soil and situation.

Mouse Thorn. See Ruscus.

Moutan.—The tree Peony. See Pœonia.

Mountain Ebony. — See Bauhinia.

Mousetail.—*Myosurus minimus.*

Mouse.—Mice are sometimes troublesome in gardens in country places, particularly where there are many bulbs planted, as they eat the solid bulbs or corms. To prevent their ravages chopped furze is sometimes buried with the bulbs, or the clipping of those hedges or rose briars is laid over the bed.

Moving Plant.—*Hedýsarum gýrans.*—See Hedysarum.

Mowing is an operation performed with the scythe, and in ornamental gardening it is used for the purpose of keeping the grass quite short and smooth. It is the most laborious operation which falls to the lot of the working gardener, and in large places there are generally a set of labourers who are not gardeners, who are kept on purpose for it. A substitute for mowing with the scythe has lately been introduced in the form of a mowing machine, which requires far less skill and exertion than the scythe, and answers perfectly where the surface of the soil to be mowed is perfectly smooth and firm, the grass of even quality, and the machine only used in dry weather. It is particularly adapted for amateurs, affording an excellent exercise to the arms and every part of the body; but it is proper to observe that many gardeners are prejudiced against it. Where a lawn is varied by numerous small beds or single trees or bushes, the scythe is required, in addition to the machine, for mowing up close to the branches or stems of the plants; but where an amateur mows his own lawn with a machine, a better instrument than the scythe for the purpose mentioned, is a pair of common hedge shears, with which the grass may be clipped as short as it can be mown. When a lawn is newly formed, and the soil is rich, it will require to be mown every eight or ten days for the first or second summers; but afterwards, when the soil becomes exhausted, and the grass grows with less vigour, once a fortnight for the three summer months will suffice, and once every three weeks or a month for the autumn.

Mulching is seldom used in flower gardens, though it may be applied advantageously to Camellias and Magnolias, and any other half-tender shrubs. It consists in laying a quantity of straw or litter round the stem of the plant, so as to cover the whole of the roots during winter, and either removing it, or forking it into the ground in spring.

Mullein. See Verbascum.

Musa.—*Musaceæ.*—The Plantain, or Banana. Stove plants, grown generally for their fruit, but very ornamental in their large leaves and curious flowers. Most of the species require a great deal of room, as they will neither flower nor fruit till they attain a large size. They should be grown in a rich loam kept moist, and they are increased by suckers. The new kind, Musa Cavendishii, flowers when of a much smaller size than any of the other kinds.

Muscari. — *Asphodeleæ.*— The Grape Hyacinth. Bulbous-rooted plants that only require planting in any common garden soil; where they may remain several years, flowering every year in succession, without any care being necessary in taking them up, &c.

Mutisia.—*Compositæ.* —Curious plants, with tendrils at the extremity of the leaves. They are natives of Brazil, and require a stove in England. They should be grown in peat and loam, and they are propagated by cuttings.

Myanthus.— *Orchidaceæ.*—Fly-wort. An orchideous epiphyte from Demerara, which should be grown in the moist stove on half-rotten wood. See Orchideous Epiphytes.

Myginda.—*Rhamnaceæ.*—Handsome shrubs, nearly allied to the Holly: natives of the West Indies. They are generally stove plants in England, and they should be grown in sandy loam.

Myoporum.—*Myopórinæ.*—Australian shrubs, with white flowers, generally kept in a greenhouse, and which should be grown in peat and sand.

Myosotis.—*Boragíneæ.*—*M. palústris*, the Forget-me-not, delights in moist places on the borders of running streams. *M. Sylvática,* which is found in woods, resembles it, but the flowers are very inferior.

Myosurus. — *Ranunculaceæ.*— Mouse-tail. A British weed, with pretty flowers, that looks well on rock-work.

Myrica.—*Myricaceæ.*—TheCandleberry Myrtle and the Sweet Gale belong to this genus, and they are both interesting to the botanist. They should be grown in loam and peat, and they are propagated by cuttings.

My'rtus.—*Myrtáceæ.*—A genus of beautiful evergreen shrubs, natives of Europe, Asia, South America, and some of them of New Holland. The common myrtle, *M. communis,* of which there are eight or ten very distinct varieties, is too well known to require any description. They are not surpassed in beauty of foliage by any exotic shrub, and the flowers are of a pure white, and, like the leaves, fragrant. The fragrance arises from an oil which is secreted in little cells, whcih appear as dots when the leaves are held up to the light. The handsomest varieties of the common myrtle are the Roman, or broad-leaved, the broad-leaved Dutch, the narrow-leaved, and the double-flowered.— They will grow in any common soil, somewhat loamy, and are propagated with most facility by cuttings of the current year's wood when it is just beginning to ripen, cut across at a joint, and then planted in sand, and covered with a bell-glass. Cuttings will root, however, taken off at any season, and treated with common care. Myrtles may also be raised from seeds, which are produced freely by the broad-leaved kinds. *M. tomentosa* is a native of China, with woolly leaves and purple flowers, which appear in June and July. *M. piménta,* now made *Piménta vulgàris,* is a native of the West Indies, requiring a stove, and is the plant producing the common allspice of the shops. The common broad-leaved myrtle will stand the winter against a conservative wall, in dry soil, in most parts of England, and also in Scotland, more particularly in low situations near the sea. In most parts of Ireland it is as hardy as the common Laurustinus is in the climate of London. Garden hedges are made of it at Belfast, and also at Cork.

N.

Nailing half-hardy shrubs against a wall is an operation that should be performed with great care; and, as the sole object of growing the shrubs is on account of their being ornamental, nothing should be shown which tends in the slightest degree to injure this effect. For this reason the nails should be small and round-headed, and strips of leather or black tape are preferable to list. Leather is sometimes preferred to list, even for fruit-trees, because it does not harbour insects; but it is too expensive to be used on a large scale. In nailing ornamental shrubs the branches should not be kept so close to the wall as fruit-trees, as half their beauty would be lost if they were deprived of their loose shoots. All that is required is to train the trunk and main branches.

Nandina.—*Berberídeæ.*—A greenhouse shrub; a native of China; with white flowers, disposed in elegant racemes. It should be grown in loam and peat; and it is propagated by cuttings of the ripe wood, the leaves of which must not be shortened, and which must be struck in sand under a bell-glass.

Napoleon's Weeping Willow.—This willow differs from the common kind in several respects, and it is probably the male variety of Salix Babylonica, of which only the female was formerly known in England. It is of much slower growth than the common kind, and therefore much better adapted for planting in a shrubbery.

Narcissus. — *Amaryllidaceæ.* — The genus Narcissus is a very extensive one, embracing, as it does, the Jonquils, the Polyanthus Narcissus, the little Hoop Petticoat, the Poet's Narcissus, and the Daffodils, besides numerous others. The late Mr. Haworth paid great attention to this genus, and divided it into thirteen new genera, none of which, however, have been adopted by other botanists, though their names have been preserved in the sections into which the genus Narcissus is now divided. All the Narcissi are quite hardy, and will grow in any common garden soil; and they are all increased by off-sets. They may be left in the ground several years without sustaining any injury; the only care necessary in their culture being not to shorten or cut off the leaves after the plant has flowered, but to leave them on till they wither naturally, as their assistance is necessary to mature the new bulb, which forms every year in the place of the old one. It is the more necessary to attend to this, as many gardeners, from a mistaken idea of neatness, cut off the leaves of the Narcissi as soon as the flowers have faded, and in this way first enfeeble, and finally kill the plants.

Nasturtium. See **Tropæolum.**

Navelwort. See **Cotyledon.**

Neck of a plant. The collar, collet, neck, or vital knot, is the point of junction from which spring the ascending stem and branches, and the descending roots. This point has been called the heart of the plant, because any injury done to it causes instant death.

Nelu'mbium. — *Nymphaceæ.* — The Indian Lotus, or Sacred Bean of India. A stove aquatic, generally with white or pale pink flowers; rather difficult to flower in this country, as it requires great heat, and abundance of room; the seeds also, which are sent over from India, only rarely vegetate. The seeds should be sown in rich loamy soil in the bottom of a large tub, which should be kept full of water while the plants are growing, but which may be allowed to become dry when the flowers have faded. The plants are increased by dividing the root, or by seeds. There are two West Indian Nelumbiums; one of which has pale blue, and the other pale yellow flowers. It must be observed, that the Nelumbium or Indian Water Lily differs essentially from the Egyptian Water Lily or Lotus of the Nile, which flowers freely in a stove aquarium. See **Nymphia.**

Nemesia. — *Scrophularineæ.* —

Little annual and perennial plants, natives of the Cape of Good Hope, which will grow in any light loamy soil; but which require protection from frost.

Nemopanthes. — *Celastrineæ*, or *Aquifoliàceæ*.—The new name for *Ilex canadensis*.

Nemo'phila. — *Hydrophyllaceæ*. —Beautiful little annual plants, natives of California, that require the usual treatment of similar plants. See Californian Annuals, and Annuals, p. 16.

Nepe'nthes. — *Cytineæ*. — The Chinese Pitcher-plant. There are two species, in common cultivation, one a native of China, and the other of Ceylon; both of them being marsh plants, and requiring the pot in which they grow to stand in a saucer full of water. *N. distillatòria* grows above eight feet high, and it shows a tendency to curl its tendrils round other plants, or any object within its reach, so as to support its pitchers, which are at the extremity of its tendrils. Both species should be grown in a peaty soil, and they both require the heat of a stove. Neither the flowers nor the fruit have the slightest beauty to recommend them. Some new pitcher plants which are said to be distinct species have been recently introduced.

Ne'peta. — *Labiàtæ*. — Catmint. Hardy herbaceous plants of no beauty, which grow freely, in any common soil.

Ne'rine'. — *Amaryllidaceæ*.— Showy bulbous-rooted plants, the type of which is the Guernsey Lily, and which are natives of the Cape of Good Hope, China, and Japan. The Guernsey lily is a native of Japan, and the reason why it has obtained its English name is said to be, that a ship laden with these bulbs and other plants from China, was wrecked on the coast of Guernsey; and that the bulbs being washed on shore took root in the sandy soil of the beach, and flourished there so remarkably as to be supposed to be natives of the island. Whether this story be true or not, it is quite certain that for nearly two hundred years these bulbs have been cultivated in Guernsey with the greatest success, growing freely in the open air, and producing abundance of offsets every year, from which the English market is supplied. In England the bulbs are generally planted in spring, in pots of very sandy loam, and placed in some window or other situation where they will have plenty of light: they flower in September and October, and as soon as they have flowered the bulbs are generally thrown away, as they are said never to flower well the second year. This is, however, entirely the fault of the grower, as if they were planted in a well-drained sunny border in the open ground, and allowed to mature their new bulbs every year by the agency of the leaves, there is no doubt but they would live as long as any of the kinds of Narcissi, and flower as freely. The bulbs might be protected in winter by a layer of dead leaves, or litter from a cowhouse; and the bed, which should be of light sandy soil, should be occasionally manured in spring by a layer of old cow-dung.

Ne'rium.—*Apocýneæ*.—The Oleander, or Rose Laurel. There are three distinct species of Nerium, besides several varieties. The first of these is the common Oleander, a native of Italy, but which is generally kept in a greenhouse in England; the second, which is called *N. flavéscens*, has yellow flowers; and the third, *N. odòrum*, which is a native of India, is a stove plant. The greenhouse species and their varieties (to which may be added *N. spléndens*, supposed to be a hybrid between *N. oleánder* and

N. odòrum) all require a soil composed of one-half loam, one quarter peat, and one quarter vegetable mould, or rotten dung; or, if this soil cannot be obtained, equal parts of peat, loam, and sand. They should be regularly watered every day; but as no water should ever be allowed to remain in a stagnate state about their roots, the pots in which they are grown should have no saucers. They should also be repotted at least once every year, and the soil shaken out from the roots, as they are plants which throw out a good deal of excrementitious matter, which poisons the soil in which they grow. This repotting should take place in spring; and, after it has been performed, the plants should be watered and set in the shade for a day or two. As soon as they begin to grow, they should have plenty of light and air, and they should be regularly watered twice a-day, observing never to let any water remain in the saucer, if the pot should have one, though it is much better without. Thus treated, the Oleander will grow rapidly, and throw out such large bunches of flowers as to form truly splendid objects. The stove species is generally grown in rather a moist heat; but it may be removed to the greenhouse, or even the open air, during the hottest months of summer, if care be taken to water its roots twice a-day, and syringe it every evening over head.

New Jersey Tea. — See Ceano'thus.

New Zealand Tea.—*Leptospérmum scopàrium.*

Nica'ndra. — *Solanàceæ.* — The Alkekengi, or Kite-flower. A strong and vigorous annual, growing five or six feet high, and throwing out numerous branches. The flowers are blue, and the fruit is in an inflated capsule, like that of the bladder nut, or winter cherry. It is a native of Peru, and its seeds should be sown in March or April, in a shrubbery or border, where the plants may have plenty of room, the seeds being put into the ground singly, and at least three feet apart.

Nicotia'na. — *Solanàceæ.* — The Tobacco. All the different kinds of Tobacco have showy flowers; but the handsomest species are *N. tabacum*, the Virginian or common Tobacco, *N. noctiflòra*, *N. multiválvis*, and *N. longiflòra*. All these are annuals, and their seeds should be raised on a slight hot-bed or warm border; and the plants, when in their second pair of leaves, should be transplanted to a bed of light rich soil, where they should be planted three feet apart every way. While the plants are young, the joints of the leaves should be frequently examined, in search of a caterpillar which is frequently found there, and which, if not removed, will eat off the points of the shoots, and consequently destroy the beauty of the plant. *N. rustica*, the common, or English Tobacco, the leaves of which are generally used for making tobacco-water, &c., should never be grown in a garden, as the flowers are of a dirty greenish yellow, and the whole plant is covered with clammy hairs, extremely disagreeable to the touch.

Nierembergia. — *Solanaceæ.* — There are four species of Nierembergia, all natives of South America, viz. *N. gracilis*, *N. aristàta*, *N. filicaúlis*, and *N. calycìna*, all of which are pretty little greenhouse plants, with whitish flowers, but not at all showy. I have been thus particular in enumerating the kinds, because from Professor Don and Dr. Graham having at first supposed that some of the kinds of Petunia belonged to Nierembergia, great confusion has arisen. The Nierembergias should be grown in peat and sand, and kept regularly watered.

Nigella. — ***Ranunculaceæ.*** —

The Fennel-flower, or Devil in a Bush. Annual plants, with showy flowers, which are, however, almost hidden by their leafy involucres. *N. hispánica* is the handsomest species. They only require sowing in March or April in the open border; or they may be sown in autumn, as they will stand the winter without protection, and will thus be ready to flower early in summer.

NIGHTSHADE.—See SOLA'NUM.

NISSOLIA. —*Leguminosæ.* — The Grass Vetch. A rare British plant, with grass-like leaves and bright crimson single flowers, which looks very well on rock-work, where it can be kept moist.

NITRARIA. — *Ficoideæ.* — Low shrubs with white flowers, which are very hardy, and will grow well in situations exposed to the sea. In gardens, the ground in which they grow should be occasionally watered with water in which saltpetre has been dissolved.

NOISETTE ROSE.—Roses which bear their flowers in bunches, and which were named from a nurseryman of the name of Noisette, in Paris, who raised the first from seed of the common China. For the culture, see ROSA.

NOLANA. —*Nolanaceæ.* — Trailing annual plants, with pretty blue flowers, that only require sowing in March in the open border. *N. atriplicifolia*, the handsomest species, strongly resembles the minor Convolvulus.

NOLITANGERE, or NOLI-ME-TANGERE. —See IMPATIENS.

NONEA.—*Boragineæ.*—The name given to the new genus, divided from Anchusa, the Bugloss, and which includes several of the most ornamental of the annual species, such as *A. versícolor*, *A. lùtea*, *A. ròsea*, &c., and some perennials. They are all quite hardy, and the annual kinds only require sowing in the open border in March.

NORFOLK ISLAND PINE. — *Araucaria excelsa.* —One of the largest trees in the world in its native country, but which can only be grown of small size in England, from its requiring protection during winter.

NOTELÆ'A.—*Oleaceæ.*—Australian shrubs with white flowers, greatly resembling in their leaves and general appearance the European olive. They are generally kept in a greenhouse, and grown in sandy peat; but they are nearly hardy, and make good shrubs for the back ground of a balcony.

NUPHAR. — *Nymphaceæ.* — The yellow Water Lily. A British plant, common in stagnant water. The popular name is Brandy Bottle, from the flowers smelling like brandy. They look very well in ponds, or even cisterns, where they will grow freely if the seeds are sown in a layer of loam at the bottom. The plants may also be increased by division.

NUTTA'LLIA.— *Malvaceæ.*—Beautiful poppy-like perennial plants, which may be planted out in summer, but which must be protected during winter in a frame or greenhouse. They should be grown in light rich soil, consisting principally of vegetable mould, with a little loam; and, when in flower, they are very beautiful.

NYCTANTHUS. —*Jasmineæ.* —The Indian Jasmine. This plant, which is generally grown in a stove in England, gives out its odour only by night, and is the plant alluded to by Moore in the following well-known lines:—

> The timid Jasmine buds, that keep
> Their odour to themselves all day;
> But, when the sunlight dies away,
> Let the delicious fragrance out
> To every breeze that roams about.

The plants should be grown in loam and peat, and would probably succeed in a greenhouse, as it is found that they do not flower well if they are kept too hot.

Nymphea. — *Nymphaceæ.* — The Water Lily. One species of this beautiful plant grows wild in England, but there are others, some blue and some pink, from Egypt, which must be grown in the aquarium of a hothouse to induce them to flower in England. They should be grown in a rich loamy soil, and kept in the warmest part of the stove.

O.

Ocynum. — *Labiatæ.* — Basil. Some of the East India perennial species are ornamental, and worth cultivating in the stove, where they should be grown in sandy loam.

Odontoglossum.—*Orchidaceæ.*— A splendid genus of Mexican epiphytes, requiring the usual treatment of similar plants. See Orchideous Epiphytes.

Œnothe'ra.—*Onagraceæ.*—The Evening Primrose. Perennial, biennial, and annual plants, with large flowers. The yellow and white flowering kinds, which are the true evening primroses, are now the only ones left in the genus, the purple-flowered ones having been removed to the genus Godetia. The evening primroses have the peculiarity of only opening their flowers in an evening, or when the sun is overcast; as, contrary to the habits of most other flowers, they seem unable to bear much light. They are all of the easiest culture, and will grow in any common garden soil, without any other care than occasionally taking up and replanting the perennial kinds, and sowing the annual and biennial ones every year in March or April. Of the biennial kinds, *Œ. nocturna* and *Œ. villosa*, both natives of the Cape of Good Hope, are rather tender; and of the perennials, *Œ. ròsea*, *Œ. cæspitòsa*, and *Œ. anisolòba*, require a slight protection during winter. *Œ. acaulis*, which is a native of Chili, though a common border flower, should have a flower-pot or hand-glass turned over it in severe frosts; *Œ. cæspitòsa*, and *Œ. anisolòba*, both splendid plants, should also be protected during winter, particularly from heavy rains, as they are very apt to damp off if they are exposed to too much moisture. Paxton recommends removing the damp soil from the roots of these plants when growing in the open ground in October, and after replacing it with dry soil, covering the plant with dry sawdust, and setting a flower-pot over it, the hole in the bottom having been first stopped to keep out the snow and rain. In this state it should remain till March, when the sawdust should be removed, and the plant covered with a hand-glass till it can bear exposure to the cold. Both kinds should be grown in a mixture of peat and loam; and both are propagated by dividing the root into pieces about an inch and a half long in autumn, and planting them.

Offsets are a natural means by which plants propagate themselves. In bulbs, the offsets are small bulbs which form by the side of the principal one, from which they should be broken off when the bulbs are taken up and replanted. In shrubs and perennial plants, the offsets either spring from the collar of the old plant or from an underground stem; and in both cases, as they are provided with roots of their own, though they draw a part of their support from the main stem, they only require dividing and replanting to form new plants.

Old Man's Beard. See **Geropogon.**

Oleander.—See **Neri'um.**

Onc'idium.—*Orchidaceæ.*—Well-known orchideous plants with very curious flowers. *O. papilio*, the butterfly plant, is certainly as much like a butterfly as it is possible to imagine a flower to be; and as it is borne on a long slender stem, which quivers with every breeze, it forms no bad representation of a beautiful insect fluttering over the neighbouring flowers. *O. altissimum* has a spike of flowers which is sometimes ten or twelve feet in length. All the kinds are very handsome, and some of them are splendid. They are all natives of South America, Mexico, and the West Indies; and as they will thrive in a much lower temperature than the dendrobiums, and some of the other orchidaceæ, they are very suitable for a small hothouse. All the kinds may be grown in pots, though some of the smallest appear to thrive most tied on pieces of wood and hung from the rafters. The soil should be turfy peat, broken in pieces about the size of gooseberries, and mixed with an equal quantity of potsherds broken somewhat smaller. The pots should be large, and filled a third of their depth with broken potsherds rather larger than those mixed with the soil. Great care should be taken in repotting any of the Oncidiums, as the roots will be found to adhere strongly to the sides of the old pot, and thus are easily broken. To prevent this, the plants should be shifted as seldom as possible; and when shifting is inevitable, they should be kept without water for several days beforehand, so that the plants may be in a flagging and feeble state, and their roots have less power of adhesion. All the Oncidiums should be regularly watered, but they should not often be syringed overhead, as they are very apt to rot if any water should lodge in the centre, or what gardeners call the heart, of the plant.

The commonest kinds of Oncidium are, *O. flexuòsum*, a very beautiful species, with a long, much-branched panicle of bright yellow flowers; *O. críspum*, the flowers of which are of a copper colour, and much undulated or curled; *O. altíssimum*, with a very long flower-stem, somewhat branched, and with yellow flowers spotted with brown; *O. lùridum*, with a panicle of greenish brown flowers; and *O. papílio*, the flowers of which are borne singly, on long, simple, and naked stalks. Besides these, there are many species nearly allied to *O. altíssimum* and *O. lùridum;* and there are also some dwarf species, such as *O. triquètrum* and *O. raníferum*, the latter having drooping racemes of very small flowers. The colours are generally yellow and brown; but *O. pulchéllum*, a very beautiful species, has white flowers tinged with pink, and *O. triquètrum* has white flowers blotched with purple. *O. raníferum* should be grown on a piece of wood hung from the rafters; and *O. papílio*, and some of the other species, may be treated in the same manner.

Onobry'chis. — *Leguminosæ.* — Saintfoin. Hardy perennial plants, some of the species of which are pretty and suitable for rockwork.

Ono'nis. — *Leguminosæ.* — The Rest Harrow. Little herbaceous and shrubby plants, some of which are natives of Britain, and which have generally yellow or pink flowers. Most of the kinds should be grown in peat, or in very sandy loam; and they are all suitable for rockwork. Some of the kinds from the south of Europe are rather tender; but they will all live in the open air, with a very slight protection, during hard frosts.

Ono'sma.— *Boragineæ.* — Perennial plants, natives of Europe, generally with yellow flowers, of low growth, and suitable for rockwork. They should be grown in sandy peat.

Opera Girls.—See **Mantisia.**

Ophrys. — *Orchidaceæ.* — Dwarf plants belonging to the terrestrial orchideæ, with very curious flowers. One of these, *O. apífera*, looks as though a bee were buried in the flower; another, *O. aranífera*, has the lip in the form of a spider; and in a third, *O. muscífera*, the whole flower resembles a fly. For the culture of these plants see **Orchis.**

Opuntia. — *Cactaceæ.* — The Prickly Pear. This is the hardiest of all the genera of cacti, as there are some species which will live in the open ground in England, with only a slight protection from frost during winter; and they grow freely in the south of Europe. The hardiest kind is *Opúntia vulgàris*, of which there are forests on Mount Etna, growing in chinks and crevices in the rocks, where there appears scarcely soil enough to contain their roots. They are equally abundant in the rocky districts of Spain, where they grow so vigorously, and so apparently in a state of nature, that a doubt has arisen whether they are not natives of Spain transported at a very early period to South America, instead of being, as is generally supposed, natives of Peru, introduced by the first Spaniards who visited that country, into Spain. The fruit which we call the prickly pear, but which is called Tuna in Spain, is so great a favourite in that country, that Karwinsky tells us, in September, hundreds of vendors sit in the streets of the Spanish towns busily employed in stripping the fruit off the branches which have been gathered loaded with it; their hands and arms being fearfully swollen with the spines which they have not leisure to avoid, so great is the impatience of the purchasers to obtain the fruit. He adds that many Spaniards will eat above a hundred prickly pears in one day; and that some indulge to such an excess, that they bring on cholera, which is often attended by death, especially if the sufferer attempts to mitigate his disease by drinking brandy. The cochineal insect is bred on *Opúntia cochinillífera*, or the Nopal tree, a native of Mexico, and much more tender than the common kind. A white woolly substance appears on the leaf-like stems of the tree, like the American blight on apple trees; and this substance conceals the female cochineal insect, which is a kind of coccus or scale, resembling that on the pine-apple and the vine. The male insect is winged, and it is only the female that produces the dye. When fully grown the insects are brushed off the plant with the tail of a squirrel or a deer; and they are killed by drying them in ovens which makes them curl up, and in this state they are ready for sale. It is on account of the value attached to the cochineal as an article of commerce, that a branch of the Nopal tree is introduced into the arms of the republic of Mexico.

All the kinds of Opuntia require abundance of dry air and intense solar light, and on this account, they do best in the open air on a sunny bank sheltered by a wall facing the south. In a stove, especially if other plants be grown in it requiring a moist temperature, the Opuntias never produce either flowers or fruit; and, indeed, often die without any apparent cause. It is hardly possible for any situation to be too hot and dry for these plants, as, like all the plants destined to live in burning sands, they are furnished with very few stomata or breathing pores, whilst they have abundant organs of absorption to draw as much moisture as possible from the soil;

and thus they are enabled to sustain heat that would dry up and wither any plants not succulent. On the other hand, these very qualities render them easily injured by a superabundance of moisture, as they have no means of getting rid of it; and it soon occasions them to damp off, or, in other words, to rot. The best soil to grow Opuntias in, is a mixture of very sandy loam with broken bricks and rubbish from old walls; they require but little water at any season, except when going into flower, and then less than any of the other kinds of cacti. They are propagated by cuttings, which must be taken off at a joint and laid on a shelf for two or three days to dry before planting; in order that the superfluous moisture may escape. When planted they should not be watered; and when young plants are raised from seed, they also should not be watered when they are transplanted. See CACTUS.

ORANGERY. — A house intended only for orange trees may be opaque at the back, and even the roof, with lights only in front, provided the plants be set out during summer. In fact, so that the plants are preserved from the frost, they will do with scarcely any light during winter; and, in many parts of the Continent, they are kept in a cellar.

ORANGE THORN.—*Citriobatus.*— Spinous shrubs, belonging to Pittosporaceæ, natives of Port Jackson and other parts of Australia, which, from bearing small orange-coloured fruit, are called Orange Thorn by the colonists.

ORANGE TREE.—See CITRUS.

ORCHIDACEÆ, TERRESTRIAL. — The terrestrial Orchidaceæ are, as their names import, those plants belonging to this extensive order which grow in the ground, in contra-distinction to the epiphytes or those which grow with their roots exposed to the air. The terrestrial Orchideæ are of four kinds, viz., those from the tropics, which require a stove in England; those from the Cape of Good Hope, which require a greenhouse; those from the south of Europe, which only need a slight protection during winter; and the hardy kinds, most of which are natives of Great Britain. The stove species require nearly the same treatment as the epiphytes (see ORCHIDEOUS EPIPHYTES); and the greenhouse species only differ from other greenhouse plants in requiring particular care to be paid to their drainage. For this purpose, the pots should be filled one quarter of their depth with broken potsherds or cinders, and the soil should consist of turfy peat broken into pieces, and sand mixed with about a third of vegetable mould. The half hardy and hardy kinds may be grown either in pots or in the open ground.—See ORCHIS.

ORCHIDEOUS EPIPHYTES. — The plants thus designated should, properly speaking, only be those which in their native countries are found hanging from the branches of trees, with their roots exposed to the air; as these only can be called air plants. It is, however, very difficult to draw a line of demarcation, as regards culture, between these plants, and the terrestrial orchideæ of the tropics, as several of the epiphytes may be grown to great perfection in pots; and others, though in a state of cultivation, they can only be grown well on branches of trees, are found growing naturally on exposed rocks. All the true epiphytes, that in their wild state are found with their roots hanging down in the air, grow in dense forests, where shade, moisture, and excessive heat, seem essential to their existence; and these plants in a state of culture should generally be grown in baskets, (such as those figured in p. 104 and p. 105,) or in husks of cocoa-nuts, half filled with moss, or tied on pieces of wood, hung up from the rafters of a damp stove, and in the shade. This rule, however, though apparently so reasonable, is not without its exceptions in practice; probably because, as it is impossible to imitate the natural climate of the plants exactly, their wants are changed by the different situation in which they are placed. Thus the West India Dendrobiums and Epidendrums, both of which in their natural state are generally found on the branches of trees, in a state of culture, thrive best potted in turfy peat or chopped moss, left sufficiently loose to allow the points of the roots to protrude occasionally, and hang down over the sides of the pot. The flowers of the Dendrobiums are generally produced in long pendent racemes; but those of the Epidendrums are erect, like those of the Oncidiums. Most of the East Indian species should always be grown on wood; particularly *Renánthera coccínea*, and all the kinds of *Vánda* and *Sarcánthus;* the East Indian Dendrobiums, and the different species of *Eria*. The species of the general *Aërides* and *Cœlógyne,* however, though both are always found on trees in their native country, may, in England, be grown in pots in turfy loam or chopped moss, or in baskets of moss. The Stanhopias and Catesetums should be grown in baskets of moss, or in pots hung from the rafters of the house, as their flowers proceed from the roots, and hang downwards; but the Cattleyas, which have erect flower-stems, are always grown in pots. Where it is not convenient to have pots hanging from the rafters, the Stanhopias must have a pile of pieces of turfy peat raised at least six inches above the rim of the pot, and the pseudo-bulbs must be placed on the top; as unless this is done, the flower-stem, when protruded from the root, will bury itself in the earth contained in the pot, and the flowers will be unable to expand, though they will easily make their way through the loose pieces of turf. Where this mode of potting is adopted, slender pieces of wood are generally passed at regular distances through the pile of turf, to keep the pieces in their place. The Catesetums grow in open parts of the woods of the tropical regions of South America, and one species is the celebrated Wourali Vine. They all require great heat and moisture, and when grown on wood it should be on that of soft-barked trees.

Various expedients have been devised to produce the shade necessary for some of the kinds of Orchideous plants. The Orchideous house has been in some cases glazed with dark-green or brownish glass, double sashes have been used, and creeping plants trained over the roof. None of these plans, however, have proved successful; as, though the plants thus treated have grown rapidly, it has been to produce leaves rather than flowers. Whether it be that the plants in an artificial state require more light than in their native woods, or whether the British sun is so much feebler than that they have been accustomed to, as to render shading unnecessary, it is certain that the Orchideous epiphytes in England require plenty of light, and that they never flower well if kept in comparative darkness.

Another point that has puzzled cultivators is to find out what kind of wood is most suitable for those kinds that are to be grown on hanging branches. Mr. Henchman, who collected Orchideæ on the Spanish Main, asserts that he never found an Orchideous plant on a dead tree, whether standing or fallen, though he found many species of Oncidium, Catasetum, &c. growing on the ground, as though they had been accidentally dislodged from the trees on which they had grown. He even observed that the colour of the *Oncidium papilio* was much darker on the ground than it was in its natural situation on the branches of a lofty tree. From his finding no Orchideæ on dead trees, he was led to suppose that the plants draw some kind of nourishment from the trees on which they live; and he also remarked that rough and soft-barked trees were their favourite abodes. He found *Oncidium papilio*, and a kind of Schomburgkia, called by the Indians the Spread Eagle, on the upper branches of trees, which were exposed to the air, and at least from twenty to thirty feet from the ground, and *O. luridum*, and the Catasetums, on branches fully exposed to the sun; while the Gongoras, Rodriguezias, and Corysanthes were on the soft and young wood, not more than seven or eight feet from the ground, in the most dense and thickest parts of the forest. These hints, and the observations of other collectors, have been of great service to cultivators; and in consequence they generally grow their epiphytes on rough-barked trees, that of the *Robinia pseud.-Acacia*, (Cobbett's Locust,) for example, half covering the log with moss, to retain the moisture, and to imitate the soft woolly bark of some of the trees of the tropics. These logs are hung from nails in the rafters, or from rods suspended across the roof; and the pseudo bulbs or rhizomas of the plants are bound on them with fine wire, and covered with Sphagnum, or some other kind of moss. Messrs. Loddiges use living plants of *Lycopòdium stoloníferum*, which have the advantage of looking better, as well as of retaining more moisture than any kind of dead moss. Mr. Beaton makes a ball of moss, which he suspends in the hollow formed by the branches of a three-forked stick, which he hangs up from the rafters till the plants are established; and then he places the stick in a pot, taking care that the length of the stick below the fork is sufficient to hold up the ball of moss with the plant attached, just above the rim of the pot—after which he fills up the pot with pieces of turfy peat. When the Orchideous plants are grown in baskets, the baskets should be made of copper wire, or if of iron, they should be painted with anti-corrosive paint. They should be formed like the basket shown in *fig.* 12, in p. 104, with the bars sufficiently apart to allow the flower stems of the Stanhopeas, and other plants sending out their flower-stems from their roots, to push their way through, and to hang down between the bars. For this reason, baskets like that shown in *fig.* 13, in p. 105, are not suitable for any Orchideous plants but those that send up their flower-stems from their pseudo bulbs. The baskets for Stanhopeas and other root-flowering plants should be from three to six inches deep, and from six to ten inches wide; and they should be filled with moss or with strips of turf two or three inches wide, and placed on end round the inside of the basket, so as to stand nearly upright, with a large flat piece in the centre. The plant should be placed in the middle, and the basket filled up with broken pieces of turf, mixed with crocks or cinders, if the plant be very delicate, and easily affected by too much moisture. These baskets are very convenient for Orchideous plants, as they may either be suspended from the roof, or placed on an inverted pot; or if the plant requires bottom heat, the basket may be placed on the surface of a pot plunged in the hot-bed. The basket also looks better and more elegant when the plant is in flower, and is wanted to be shown in a drawing-room. When Orchideous plants arrive from abroad, Mr. Beaton first throws them into water; and after they have been thoroughly washed, he puts them into a heap, covered with a damp mat, where they remain for several days, after which he plants them in baskets, or ties them on moss supported by a forked stick, as above described.

OR'CHIS.—*Orchidàceæ.*—Most of the species of the genus Orchis are natives of Europe, and a great number of them are found wild in Britain. With respect to culture, they may be divided into two classes; those which grow naturally in peat or heath mould, such as *O. maculàta*, *O. mòrio*, *O. máscula*, &c.; and those which grow in dry chalky soils, such as *O. simia*, *O. militàris*, *O. fúsca*, *O. tephrosánthos*, and *O. ustulàta.* In general little can be done in the way of propagating Orchises, excepting by seed; but they may be taken up in their native localities when in flower, with a ball of earth about three inches square to each, and being planted in suitable soil in an open situation in the garden, they will live and flower for several years. Seeds, if collected when ripe, and sown immediately, will come up freely; and if the soil and situation be suitable, they will flower freely the second or the third year. The same observations will apply to *Ophrys*, *Hermínium*, *A'ceras*, *Goodyèra*, *Platanthèra*, *Gymnadènia*, and several other genera formerly included in the genus Orchis. Most of the British Orchises grow well in pots, and they may be forced as easily as the common Hyacinth. The kinds of Orchis which bear flowers resembling insects, are now mostly included in the genus OPHRYS.

ORDER. The necessity of order is strongly evinced in a flower-garden, as the plants in it lose half their beauty unless they are placed according to some regular plan, or order of arrangement: thus they may be either in masses of one colour, or of one kind; or they may be arranged according to size, or according to some botanical system, at pleasure. But whatever mode of arrangement may be adopted, it will be found that not only the interest excited by the garden, but its beauty will be greatly increased by some regular order being followed throughout.

In a botanical point of view the word Order signifies a number of genera which coincide in several important particulars. As for example, according to the natural system, the order Cruciferæ includes all the plants that have their flowers like a Greek cross; and according to the Linnean system, the order Trigynia includes all the plants belonging to any particular class, the flowers of which have three styles, &c.

ORIGA'NUM.— *Labiàtæ.* — Marjoram. *O. vulgàre*, the common Marjoram, is plentiful on chalky soils in various parts of England; and it may be planted in patches in gardens or shrubberies where bees are kept, for the fragrance of the flowers, and the delight which the bees appear to have in them. The Sweet Marjoram, *O. majoràna*, a native of Portugal, is cultivated in England as a pot-herb; and for the Hop Marjoram, or Dittany of Crete, *O. Dictamnus.* See *Dittany.*

ORNITHO'GALUM. — *Asphodeleæ.* The Star of Bethelem. Bulbous plants with white star-like flowers, some of which are frequently kept in the greenhouse, but all of which may be grown in the open ground, if the bulbs are planted in a tolerably dry soil, four or six inches deep. Some of the handsomest kinds are *O. pyramidàle*, a native of Spain, the unopened flower-stalks of which are sold in the market at Bath, and other places in the West of England, for the table, under the name of Prussian asparagus; *O. latifòlium*, a native of Egypt; and *O. caudàtum* from the Cape of Good Hope. The latter two are generally considered greenhouse plants, but they only require protection from severe frosts.

Orobanche. — *Orobancheæ.* — Broom rape. Parasitic British plants growing on the roots of other plants, which they destroy. They have erect stems, somewhat scaly and bulbous at the base, and terminating in a spike of rather large purplish or brownish flowers. They are almost incapable of culture, as their seeds will lie dormant in the soil for years, till they meet with a plant to the roots of which they can attach themselves; but if it should be wished to grow them, a few seeds of *O. major* may be sown on the roots of any kind of broom or furze, and of *O. caryophallacea* on the roots of any kind of bramble or of *Gallium mollugo;* and they will probably germinate. *O. rùbra*, which is very fragrant, may in the same manner be sown on the roots of wild thyme; and *O. elatior* on those of *Centaurèa scabiòsa*, the greater Knapweed.

Orobus. — *Leguminosæ.* — The bitter vetch. Pea-flowered, perennial plants, some of which are very ornamental, natives of Europe and North America, which should be grown in peat and loam, and are increased by dividing the root.

Oryza.—*Graminea.*—Rice. This plant is occasionally grown as an object of curiosity in England, though the climate is not hot enough to ripen the grain. It is a marsh plant, and requires to have its roots constantly supplied with water.

Osage Orange.—See **Maclura.**

Osbeckia. — *Melastomaceæ.* — Handsome stove plants, remarkable for their showy flowers, and strongly ribbed leaves. They should be grown in peat, mixed with one-third of sandy loam, and kept moist. They are propagated by cuttings.

Osmunda.—*Filices.*—The flowering Fern. This is by far the handsomest of the fern family. A native of Britain, which produces a fine effect in a shrubbery, or among trees; and which should be grown in peat, or other light soil, and kept moist.

Oswego tea.—See **Mona'rda.**

Osyris.—*Osyrideæ.*—The Poets' Cassia. A pretty little shrub, with white flowers, a native of the South of Europe; which should be grown in loam and peat, and which is propagated by cuttings.

Othonna. — *Compositæ.* — Ragwort. Coarse growing greenhouse or frame annuals, perennials, and low shrubs, all with yellow flowers, and all natives of the Cape of Good Hope; which are generally grown in loam and peat, and which only require the usual culture of their respective kinds.

Oxalis.—*Oxalideæ.*—Wood Sorrel. Mostly perennial and tuberous-rooted plants, from the Cape of Good Hope; but some few of which are natives of Britain, and others of Mexico and other parts of America. They have showy flowers, and are easily cultivated in sandy peat kept moist. All the Cape species require protection during winter, and are generally grown in pots.

P.

Pæo'nia.—*Ranunculàceæ.*—The herbaceous species are well-known showy flowers, which thrive in deep sandy soil, and are propagated by division; and the suffrutescent or shrubby kinds, of which there. —

several varieties, thrive in similar soil, and are propagated by laying down the shoots, cutting behind each bud, and covering them throughout their whole length by an inch or two of sand or sandy soil. Each bud thus treated will throw up a shoot and emit roots, and after a year may be cut off so as to form a distinct plant. The tree peony, as it is called, is quite hardy in the climate of London; but as the flowers and leaves come out early, they are liable to be injured by spring frosts, and it is therefore desirable to protect them by a horizontal covering a foot or two above the plant, which by reflecting back the heat radiated from the soil keeps up such a temperature as prevents the plant from freezing. There are many very handsome varieties of the tree Peony, both double and single, but that which is most esteemed is the *P. moùtan papaveraceæ*, a single variety in which the petals are large and white, with a dark purple mark at the base. A few years ago this variety sold at six guineas a plant, but it may now be obtained from 3*s*. 6*d*. to 5*s*. Both the herbaceous and shrubby peonies seed freely; and as by fecundating the flowers of one species with those of the others, new varieties may be easily procured, raising seedling peonies forms a source of interest for amateurs.

Palavia.—*Malavaceæ.*—An elegant annual plant, generally raised on a hot-bed, and planted out in May; but which may be sown in the open border in April.

Paliu'rus. — *Rhamnaceæ.* — Christ's Thorn. A curiously bent thorny shrub, with very oddly shaped flat fruit, which has given rise to the French name for the plant of *porte-chapeau*. It is a native of Asia, and it will grow in any common garden soil.

Pancratium.—*Amaryllidaceæ.*—The Sea Daffodil. Splendid lily-like bulbous-rooted plants, some of which require a stove, and others the greenhouse. They should be grown in light loam and vegetable mould; and should be allowed a season of rest, by being kept without water when not in a growing state.

Pansy.—See Heartsease.

Papaver.— *Papaveraceæ.* — The Poppy. Showy annual and perennial plants, which will grow in any common garden soil; and which being quite hardy, only require the common treatment of their respective kinds.

Papy'rus.—*Cyperaceæ.*—An interesting marsh plant, which requires a stove in England, and which is worth growing from its having been the only paper used by the ancients. It should be planted in loam at the bottom of a tub or cistern.

Parasites are plants which root into other plants, and differ from epiphytes in that circumstance, the latter only growing upon the outside of the branches of trees, and deriving nourishment from the decay of the outer bark, and the moisture which it retains from its porous corky nature. The only ligneous parasite which is grown in this country is the Miseltoe, which is propagated by bruising the berries, and causing them to adhere to the bark, (see Viscum,) and the chief epiphytes are some of the stove Orchidàceæ. The British herbaceous parasites are *Cúscuta epithymum* and *C. europæa* upon clover and hops, and *Orobanche major* and *Lathrea squamaria* on the roots of forest-trees. The hardy epiphytes of Britain are the lichens and mosses, which grow on the bark of old trees, or stunted young trees in moist shady situations, and some species of ferns, such as *Polypòdium vulgàre*, which, is often found growing on the bark of old Pollards in the central districts of

England, and in great abundance on trees in the moist climates of Devonshire, Lancashire, Cumberland, &c. It is very abundant on the Oaks in the grounds of the Poet Wordsworth, on the banks of the lake of Ambleside. Almost the only herbaceous parasite which can be conveniently cultivated in gardens is the *Cúscuta europæa*, the seeds of which when gathered on heaths or in hop grounds, may be sown at the roots of almost any herbaceous plant in gardens, when they will spring up, twine round it, and perhaps ultimately strangle it. *Cúscuta verrucósa* is sometimes grown in greenhouses on Geraniums, and is noted for the fragrance of its blossoms. (See CUSCUTA.) *Orobanche màjor* is very common in clover fields in Norfolk, and greatly injures the crops of that valuable forage plant. It also grows on the roots of broom and furze. See OROBANCHE.

PARASOL ACACIA.—*Robinia umbraculifera*. See ROBINIA.

PARTERRE. The French term for what in England is called a flower-garden, but which in France in former times when the word was originated, was most frequently a figure formed on the surface of the ground by turf, box, and gravel or sand, with occasional flowers or low shrubs. In these parterres flowers and shrubs were altogether secondary objects, the main features being the compartments of turf and the curious scroll-work of box. The French divided their parterres into three kinds: parterres of embroidery, which consisted chiefly of scroll-work or arabesque figures of box kept low by clipping; *parterres de compartiments*, which consisted chiefly of beds of turf of different forms, varied by small shrubs clipped into regular shape, and *parterres anglaises*, which consisted of turf in large masses, with beds of flowers surrounded by box. Parterres of embroidery are now rarely to be met with either in France or England; they have been totally destroyed at Versailles and Fontainebleau; and in England, though we have old French gardens at Levens near the Lakes of Westmoreland, at Roxton near Banbury, and other places, yet almost the only parterres of embroidery of long standing are at Wentworth Castle, Yorkshire, and Holland House, in Kensington, and the more recently formed ones at Wrest in Bedfordshire, and Trentham Hall in Staffordshire. Parterres of compartments among the French generally consisted of one square, round, or parallelogram plot of turf in the centre, surrounded by a border of narrow beds planted with flowers and low shrubs, and these are at present common both in France and England. *Parterres anglaises* may now be considered as included in the parterres of compartments; because the French do not now cut up the ground into so many beds as formerly, and plant a great many more flowers than they did in the time of Le Nôtre. In all the French parterres of former times, and also in most of those imitated in England, the groundwork, or in other words, the little walks on which the arabesques of box appeared to be planted, were of different coloured sands, gravel, shells, powdered stones or brick, so as to exhibit different colours in the same parterre; but that practice is now left off both on the Continent and in Britain. In a word, parterres are now assemblages of flowers in beds or groups, either on a ground of lawn or gravel; in the former case the beds are dug out of the lawn, and in the latter they are separated from the gravel by edgings of box or stone, or of some plant, or durable material. The shape of the beds in either case depends on the style of architecture of the house to which the parterre belongs, or to the taste and fancy of the owner. Whatever shapes are adopted they are generally combined into a symmetrical figure; for when this is not the case the collection of beds ceases to be a parterre, or a flower-garden, and can only be designated as a group or collection of groups on a lawn. Hence it is that all parterres and regular flower-gardens ought to be separated from the scenery by which they are surrounded by a line of demarcation, such as a low architectural wall with a balustrade and piers, and vases; a low evergreen hedge, a canal, a ridge of rockwork, a sunk fence with the sides of turf or of stone, a raised fence with the ridges and top of turf, or a raised terrace-walk of grass or gravel.

In planting parterres there are two different systems; one is to plant only one kind of flower in a bed so as that each bed shall be a mass of one colour, and the other is to plant flowers of different colours in the same bed. It is almost needless to state that the former system is by far the best for general and striking effect; but as a parterre is frequently a kind of botanic garden, and as in this case it is desirable to keep all the species of a genus together, flowers of all colours must occasionally occur in the same bed. In general, botanic parterres should not be mixed with parterres for effect, because the one kind never fails greatly to injure the other.

In planting parterres for general effect, the colours should be arranged so that those which are adjoining each other should be contrasts; and those which occupy corresponding parts of the same figure should be the same. For example, suppose a bed on one side of the centre to be planted with yellow flowers, the corresponding bed on the other side (the figure being *symmetrical)* should also be planted with the same kind of yellow flowers, for the sake of preserving the symmetry. Sometimes the corresponding bed of colours may be planted with a different species, having flowers of the same colour which appear at the same time, but in general this cannot be done successfully, partly on account of the different shades of colour, but chiefly because it is scarcely possible to get two plants of different species, even though they are of the same colour and flower at the same time, that will prove so exactly alike as to have the same aspect. The colours which contrast with one another are generally well known, particularly to ladies; such as blue and yellow, orange and purple, red and green, &c.; and in practice any two colours which do not contrast well naturally, may be brought together or near each other by the intervention of white, or of a very dark colour approaching to black. Mignionette forms a good substitute for white, though there are many white flowers; and *Lòtus jacobæ'us* forms the nearest approach to black. As the prevailing colour in garden scenery is green in all its different shades and mixtures, so the prevailing colour in parterres ought to be red, and all its various shades and mixtures. Next to red, yellow, orange, and all their various shades and mixtures, ought to prevail, as contrasting with the blue of the sky, and with that of water, should there be any near the flower-garden. In choosing the colour for any particular flower-bed, it is necessary to consider what colours are to be placed adjoining it; and in choosing the colour for plants to be placed in vases or pots, it is necessary to consider the background against which they are to be seen. For example, an elevated vase with the sky for a background should never be planted with either blue or purple flowers; but orange or red flowers in such a vase will have an admirable effect. In botanic parterres, only one plant of a species or variety is planted; and that ought to be kept perfectly distinct from every other by a space an inch or two in width being left all round it; but in parterres for effect, the whole surface of the bed ought to be covered with the same kind of flower, and no part of the soil should be seen. Hence, for this kind of parterre, low-growing plants, and trailers, or creepers, such as Nierembergias, and Verbenas, are most desirable; and free-flowering tall plants, such as Petunias and Dahlias, ought to be pegged down. One of the most useful plants for producing white in parterres of effect is the common Petunia, and for red the different kinds of scarlet Pelargonium, or *Verbena Melindres.*

The laying out and planting of parterres should always be attended to by the ladies of the place, because it requires a degree of taste and artistical feeling which is very seldom to be found among some gardeners to a sufficient extent; and which, indeed, can hardly be expected in many of them.

Pasque Flower.—See Anemone.

Passeri'na.—*Thymelæa.*—Sparrow-wort. Most of the species are Cape shrubs, which require a greenhouse in England, and should be grown in sandy peat; but one species, ***P. hirsuta,*** is a native of the South of Europe, with small yellow flowers. They are all more curious than beautiful.

Passiflo'ra.—*Passiflòreæ.*—The Passion Flower. The common Passion Flower, ***Passiflora cærulea,*** is a very ornamental climber, which will live in the open air in the climate of London, flowering abundantly, and ripening fruit every year. It requires a good and somewhat loamy soil; and where the soil is light and sandy, a pit two feet deep and two feet square should be dug out and filled with a mixture of loam and peat. This pit may appear large for a plant with such a slender root and stem as the Passion Flower; but it will not thrive unless plenty of room be allowed for its roots, and, on this account, only the dwarf species can be grown in a pot. There are several kinds of Passion Flower which require a greenhouse, and some very splendid ones that cannot be grown without a stove. Of the latter, the most beautiful is ***P. Loudòni,*** the flowers of which are of a most brilliant crimson. Nearly all the kinds ripen seed freely, and the fruit, which is a kind of berry, is eatable but insipid. All the kinds hybridize freely, and thus many new kinds may be raised. Some of these hybrids are very beautiful, particularly those raised from ***P. racemòsa;*** and some of these raised between the stove kinds and ***P. cærùlea*** are nearly hardy. They are all easily propagated by cuttings, which should be made of the young shoots, and struck in sand, in heat, under a bell-glass.

Passion Flower.—See Passiflora.

Paterso'nia.—*Irideæ.*—A fibrous-rooted genus of very beautiful plants, natives of New Holland. They should be grown in sandy loam and peat, and increased by dividing the root or by seeds. They require a little protection during winter, and, on this account, they are generally grown in pots, and kept in a frame or greenhouse.

Pa'via. — ***Hippocastanàceæ,*** or ***Æsculàceæ.*** The American Horse-chestnut or Buckeye. These plants differ from the common horse-chestnut in their fruit, which is in a smooth husk, while that of the horse-chestnut is in a rough husk. They derive their American name of Buckeye from the large brown spot on the side of the seed, the botanical name of which is the hilum. Several of the Pavias are shrubs, and one of them, ***P. rubra***, is almost prostrate. They are all very handsome, particularly the dark red and yellow-flowered kinds, and ***P. macrostachys***, which has long feathery white flowers. They will grow best in loamy soil; and they are all propagated either by seeds or layers, or by grafting or budding them on the common horse-chestnut.

PEAT BOG consists entirely of vegetable matter decayed by being saturated with moisture, but which requires to be decomposed or mixed with some earthy matter to render it fit for vegetation. As it is the tannin which abounds in the liquid part of peat bog, which prevents the decomposition of the vegetable fibre it contains, it is only necessary to drain it of its superabundant moisture to convert it into peat earth; in which state it is used in gardening for the growth of large American plants, such as Rhododendrons, &c., in the open ground. Heath-mould is peat mixed naturally or artificially with a large proportion of fine white sand; and, in this state, it is used in greenhouses for growing Heaths, and other Cape and Australian shrubs with fine hair-like roots, in pots. When greenhouse shrubs are directed to be grown in peat, it is always understood to mean a mixture of peat and silver sand, and not black peat alone.

PELARGO'NIUM.—See GERA'NIUM.

PELLITORY, COMMON.—*Pyrèthrum Parthènium.*—See PYRETHRUM.

PELLITORY OF SPAIN. *Anthemis Pyrethrum.*—See ANTHEMIS.

PELO'RIA.—A curious variety of the common Toad-flax.—See LINA'RIA.

PENTSTE'MON.—*Scrophularineæ.*—The two genera Cheloné and Pentstemon are so often confused together, that it may be useful here to copy the *very clear* distinctions which Dr. Lindley has laid down between them for the sake of such of my readers as may be botanists. "Cheloné has a ringent corolla, seated among round imbricated bracteæ; its anthers are fastened together by a dense mass of wool, and its seeds have a membranous margin. Pentstemon, on the contrary, has a bilabiate corolla, with only a single bractea, which is at a considerable distance from it; its anthers are distinct from each other, and either perfectly smooth or at most only slightly pubescent; and its seeds are destitute of a membranous margin. The habit of the two genera is also strikingly different." To those who are not botanists it may be sufficient to remark, that the flowers of the Cheloné are short and inflated, and crowded together; while those of the Pentstemon are long and funnel-shaped, and far apart. The Pentstemons are generally hardy or half-hardy plants, suffering less from cold than from damp during winter; and as they all are very apt to damp off at that season, it is a good plan to take cuttings of all the kinds grown in the open ground in autumn, and to strike them in sandy peat, keeping them in a greenhouse or some dry place till spring, when they may be planted in the flower border. All the Pentstemons are beautiful North American perennials, growing from one foot to two feet in height, with white, pink, blue, or purple flowers, produced from March to October. Most of them will grow in common garden soil, and the rest in loam and peat; and they are all readily propagated by division of the roots, or by seeds or cuttings. ***P. campanulàtus*** grows a foot and a half high, and produces its light purple flowers from March to October, and ***P. ròseus*** produces its red flowers during the same period; ***P. pulchél-lus*** grows a foot and a half high, and produces light purple flowers in June and July. *P. speciòsus* grows two feet high, and produces its beautiful blue flowers in August and September. *P. Murrayànus* (the handsomest of the genus) grows about two feet high, and produces its brilliant scarlet flowers in August, but is rather tender. *P. Còbœa* grows about a foot and a half or two feet high, and produces its large light purple or pinkish flowers in August, and is also rather tender. *P. Scoulèri*, which grows three feet to four feet high, and produces its purple flowers from May to July, is suffrutescent, and succeeds either in the open border or forms a beautiful object against a conservative wall. On the whole, all the species are beautiful, and none of them are of difficult culture.

Perado.—The name for a kind of holly, a native of Madeira, *Ilex Perado;* which is only half-hardy in England. It makes, however, a beautiful tree, which will stand without protection in the open air, if it is grafted standard high, on a tree of the common holly.

Perennial Plants are those permanent plants which are not woody, but which generally die down to the ground every year and spring up again the year following. There are some, however, which are called evergreen perennials which never die down to the ground, such as Pinks, Carnations, several kinds of Saxifrage, &c. Perennials have the great advantage over annuals and biennials, that they do not require renewal from seed, but are propagated by division of the root or division of the plant. Bulbous plants are perennials, and they are propagated by separating the offsets, which may be considered as a kind of division of the root. Tuberous-rooted plants are propagated by separating the tubers; and when these tubers are furnished with eyes like the potato, they may be cut into pieces, preserving an eye to each; but when they are without eyes or buds excepting at their upper extremity, as in the case of the Dahlia and the Garden Ranunculus, each tuber must be separated from the parent plant entire with its bud. The great majority of plants which ornament the miscellaneous borders of a flower-garden are herbaceous perennials, including under this term bulbs and tubers. All the hardy bulbs in a flower-border, except those of the Hyacinth and the Tulip, should be kept as dry as possible during winter, as they are more liable to be injured by wet than cold; and when they are taken up to remove their offsets, &c., it should be in autumn when the leaves have withered, and they should be planted again as soon as practicable, as they are very apt to be injured by damp, &c., if they remain long out of the ground. Tubers, on the contrary, such as those of the garden ranunculus and the dahlia, must be taken up every year as soon as they have done flowering, and only replanted just before the growing season commences, as, if left in the ground, they are very apt to rot; the bulbs of the hyacinth and the tulip thrive best when treated in the same manner. The fibrous-rooted perennials should be taken up and divided when they are growing too large; and even when division on this account is not necessary, most of the kinds are benefited by taking up and replanting in fresh situations occasionally, on the principle of the rotation of crops. This is, that all plants throw out excrementitious matter, which is poisonous to themselves though wholesome for other plants; and thus, in the course of a few years, the ground in which plants grow becomes unfit for them. Nature has provided a remedy for this by elongating the roots of all perennial plants, whether ligneous or herbaceous, every year; and this is sufficient to prevent trees and shrubs in permanent plantations from being injured: but from the constant digging, &c., in a garden, perennial herbaceous plants are very seldom permitted to extend their roots to a sufficient distance to find suitable soil; and they are therefore benefited by taking up and replanting, or laying down decayed leaves or fresh soil over their roots. The season for taking up and replanting perennial plants should be either in autumn after they have done growing, or in spring before they begin to grow; and if the soil about the roots looks black and saturated with moisture, or, as the gardeners express it, "sour," the roots should be washed quite clean before replanting. Where the roots are to be divided, it may be done, if they are large, with the spade, or if they are small with a knife; and, at all events, they should be cut smooth, and trimmed (that is, all the bruised parts removed) with a sharp knife, before replanting.—See Planting.

Pergula'ria.—*Asclepediaceæ.*—*P. odoratissima* has, perhaps, a sweeter fragrance than any other plant known. The flowers are green and of no peculiar beauty, but they are most valuable for their delightful fragrance, which is chiefly perceptible at night. The Pergularia is a stove-climber which should be grown in a large pot (a 12) with holes in the sides, which should be plunged into the centre pit of the stove and kept moist. The soil should be sandy loam or chopped turf mixed with leaf-mould; and it is propagated by cuttings struck in sand with bottom heat, and covered with a bell-glass. It should be cut back every year when it has done flowering; and it will shoot out vigorously in Spring.

Periplo'ca.—*Asclepediaceæ.*—*P. græca* is a handsome hardy climber with velvet-like flowers of a very singular colour, being a dark purplish maroon. It will grow in any light rich soil, and it is very suitable for covering arbours. It is said to be fatal to flies, and that a number of dead flies may be swept up every day in bowers covered by it. It is a native of the Canary Isles, and it is propagated by layers or cuttings, both of which grow freely.

Peri'skia.—*Cactàceæ.*—The Barbadoes or West India Gooseberry. This plant bears very little resemblance to the other kinds of Cacti, as it has thin leaves and a round stem like any other ligneous plant. *P. aculeàtus*, the commonest kind, has white flowers; but the flowers of *P. Bleo* are of a beautiful pink. The fruit resembles a gooseberry and is very good to eat. The Periskias are quite hardy, growing in the same temperature and requiring nearly the same treatment as the Opuntia or common Indian fig; (see Opuntia;) and *P. aculeàtus* is frequently used as a stock for grafting on it the more tender kinds of Cacti.

Periste'rea.—*Orchidaceæ.*—The Dove Flower. Beautiful Peruvian epiphytes, which should be grown on wood.—See Orchideous Epiphytes.

Periwinkle.—See Vinca.

Perne'ttya. — *Ericàceæ.* — A pretty little evergreen bush, a native of Terra del Fuego, with white heath-like flowers. It is quite hardy, and only requires to be grown in a bed of peat soil.

Persica'ria.—See Polygonum.

Petræ'a.—*Verbenàceæ.*—*P. volùbilis* is a climbing plant with long and beautiful racemes of dark purple flowers, and large dark green leaves. It is a native of Vera Cruz and Martinique, where it ascends to the summit of lofty trees, hanging from branch to branch in graceful festoons, and producing its flowers in great abundance. In England, though it has been introduced since 1733, it is rarely seen in flower for want of proper management; but to make it flower freely, it only requires to be pruned like a common grape-vine, that is, to have the leading shoots stopped at the second joint to make them throw out side shoots, and to have these stopped in the same manner, in order to have what the gardeners call spurs, distributed over all the branches; for it is on these spurs only that the flowers are produced. This plant is called, in the Antilles, the Easter Flower, because it flowers about Easter; and it is used for decorating the Spanish churches at that season. In England it generally flowers in August. It should be grown in chopped turfy loam mixed with a little peat to keep it open; and it is propagated by cuttings struck in heat.

Petty Whin.—*Genísta ánglica.*—See Genista.

Petu'nia.—*Solanaceæ.*—Perhaps no plants have made a greater revolution in floriculture than the Petunias. Only a few years ago they were comparatively unknown, and now there is not a garden, or even a window, that can boast of flowers at all, without one. ***P. nyctaginiflòra***, the common white Petunia, was first brought from Brazil in 1823; and as it was thought very nearly to resemble the common tobacco, it was called Petunia from ***Petun***, which is the Brazilian name for that plant. This plant was cultivated but sparingly, and only in greenhouses as a perennial, till 1830, when ***P. viòlacea***, or ***P. phœnìcea***, as it is sometimes called, was introduced from Buenos Ayres by Mr. Tweedie; and from this species, hybridized with ***P. nyctaginiflòra*** and ***P. bìcolor***, most of the innumerable hybrids now in our gardens have been produced. All these kinds are found nearly hardy, and they may either be treated as half-hardy annuals, being raised on a slight hot-bed and planted out in May, or they may be sown in the open ground as soon as the seed is ripe, or in March or April, or suffered to sow themselves; care being taken in all cases in the open air to choose a sheltered situation, and to lay a few dead leaves over the bed if the weather should be severe. When treated as greenhouse plants these Petunias all become shrubby, but they will not live more than two or three years, and they should be cut down as soon as they have done flowering. When they are wanted to grow to a large size, and to cover a trellis, &c., like climbing plants, they should be planted in the free ground, in the conservatory, or in the open air, in a light rich soil or, if they are kept in pots, allowed plenty of room for their roots, as, unless this is done, they will become drawn up with long weak stems, bare of both leaves and flowers, to a considerable height. When they are wanted to form strong bushy plants for setting in a window or keeping in boxes under a verandah, the end may be attained by planting them first in very small pots and shifting them into others, gradually becoming larger and larger, always pinching off the flowers, and tips of the shoots, till the plants have attained the desired form and size, when they may be allowed to flower, and will form splendid objects. When Petunias are wanted to cover a bed in a regular flower-garden, they are not cut in at all; but their long rambling shoots being pegged down all over the bed, a number of side-shoots will be sent up, which will soon become covered with a mass of flowers. The hybrid, ***P. spléndens***, treated in this manner in Lady Granville's flower-garden at Dropmore, is, when the sun shines upon it, almost too brilliant to be looked at. ***P. intermèdia***, sometimes called

Salpiglóssis lineàris, is a dwarf shrub, a native of Panama, introduced in 1832, which requires to be kept in a greenhouse in England.

A great confusion has arisen about the name of the purple-flowered Petunia, as, when it was first raised at Glasgow from the seeds sent home by Mr. Tweedie, it was supposed, by Sir W. J. Hooker, to be a Salpiglossis; and it was figured and described by him under the name of *Salpiglóssis integrifòlia* in the Botanical Magazine, t. 3113. It was afterwards figured and described by Professor Don, in Sweet's British Flower Garden, second series, t. 172, under the name of *Nierembérgia phœnìcea;* and lastly, by Dr. Lindley in the Botanical Register, t. 1626, as *Petùnia violàcea*. It is very remarkable that there should have been so many doubts among botanists as to the genus of the purple Petunia, as it appears to common observers to differ from the white only in colour; and it is also remarkable that it should have been first called phœnicea, which signifies crimson, when it is decidedly of a violet-coloured purple. The flowers of the white Petunia, and of all the hybrids raised from it, are fragrant, particularly at night; while the few hybrids raised between *P. violàcea* and *P. bìcolor*, and the numerous seedlings of the former species, have no fragrance. *P. bìcolor* does not hybridize so freely as the other kinds, and it is more tender; but all the dark-mouthed and streaked kinds are raised partly from it, and they are generally hybrids between it and the white Petunia; the latter kind producing the seed, as *P. bìcolor* rarely ripens seeds. No plants are more easily trained than the Petunias; and, with a little care and attention, they may be made to cover trellis-work or wire-frames of various different forms.

Peyro'usia.—*Irìdeæ.*—A genus of bulbous-rooted plants with rather small flowers, generally in corymbs, which require the usual treatment of Cape bulbs.—See Ixia.

Phace'lia. — *Hydrophýlleæ.* — Very curious plants, which produce their flowers in one-sided fascicles which unroll themselves slowly. The flowers are rather pretty in themselves, but are half hidden by their bracts and coarse-growing leaves. All the species are natives of America, but some are found in California, some in Peru, and some even as far south as the Straits of Magellan. Some of the species are perennials, and others biennial or annual. The Californian species are annuals with blue flowers, but the South American kinds are biennials or perennials with pink flowers. They all grow freely in any common garden soil.

Pha'ius.— *Orchidàceæ.* — *P. álbus*, which is an exceedingly beautiful East Indian epiphyte, is remarkable for the dry and withered appearance which it presents when it enters into its dormant state. At this period it sheds its leaves, and its stems become covered with a dry brownish skin, which makes them look exactly as if they were dead. It should then be removed to a cool situation, where the heat is not greater than 40° or 45° of Fahrenheit, and kept with only enough water to prevent it from dying. In the course of a few weeks, a young shoot will begin to push out from the crown of the root; and as soon as this is perceived, the plant should be repotted in sandy peat, (the pot being first nearly half-filled with potsherds,) and removed to the orchideous house, where it should be exposed to a strong heat and syringed twice a day with a copious supply of water to the roots till the appearance of the flowers, when it should be removed to a cooler atmosphere, say that of a drawing-room, and be no longer syringed.

Phalæno'psis. — *Orchidaceæ.* — The white Butterfly Plant. This beautiful plant, which certainly resembles a white butterfly as much as *O. papilio* does a tortoiseshell one, should be grown on a piece of wood with the bark on, hung from the roof of the hothouse, the roots being wrapped in moss and tied on the branch. It flowers profusely, but it is very difficult to propagate.—*See* Orchideous Epiphytes.

Pharbi'tis. — *Convolvulaceæ.* — The new name given by M. Choisy to *Convolvulus major* and some few other species. The difference between this new genus and the genus Convolvulus, consists in the shape of the stigma, and in the number of cells in the capsule.

Phaseo'lus.—*Leguminosæ.*—The Scarlet-runner, *P. multiflorus,* was cultivated at its first introduction as a garden flower ; and it is still often grown for ornament in small street-gardens, by sowing the seeds in the ground, and training the plants up pieces of packthread, fastened to a hook or nail in a wall at one end, and to a peg stuck in the ground at the other. There is a variety with red and white flowers which is very ornamental.

Philadelphus.—*Philadelpheæ.*—The Syringa, or Mock Orange. North American hardy shrubs, common in shrubberies, the flowers of which smell like those of the orange, and the leaves taste like cucumbers. It is rather remarkable that one of the English names of these plants is Syringa ; which is the botanic name of the lilac, to which they have not the slightest affinity. There are many species ; some of which have very large and handsome flowers, and some bear flowers without any fragrance. They are all quite hardy, and will grow in any soil or situation ; and they may all be propagated by seeds, layers, cuttings, or division of the root.

Phillyrea.—*Oleineæ.*—Evergreen bushy shrubs, natives of Europe and some parts of Asia, which are very useful in British gardens, from their shining dark green leaves, and small fragrant white flowers. They are often confounded with the Alaternus, from which, however, they are botanically quite distinct, as that shrub belongs to Rhamnaceæ. The Phillyrea is generally found in the shrubberies of old mansions, as from the time of Gerard, till Evelyn so warmly patronised the Holly, the Phillyrea and the Alaternus were the principal evergreens planted in British gardens ; and both were great favourites for topiary work, as no plants are clipped more easily into figures of animals, &c. All the kinds are quite hardy, and will grow in any soil or situation ; and they may be all propagated by seeds, layers, or cuttings.

Phlo'mis.—*Labiatæ.*—The Jerusalem Sage. Perennial and shrubby plants with large coarse-growing glaucous leaves, greatly resembling those of the common sage, and yellow or purple flowers disposed in a whorl round the joints. All the species will grow in any light rich soil ; and they are propagated by layers or cuttings, or by dividing the root.

Phlo'x.—*Polemoniàceæ.*—A genus of beautiful North American perennials and one annual, of which there are some species in flower almost every month in the year. They thrive best in sandy loam and peat, but many of the species will grow in any common soil. *Phlóx setàcea* is a low trailing perennial, which produces its flesh-coloured flowers in April and May. *P. nivàlis* is of equally low growth, and it produces its white flowers at the same period.

P. subulàta seldom exceeds three inches in length, and it produces its beautiful flesh-coloured flowers from April to June. *P. canadénsis* has blue flowers, which are produced in April and May, and it grows almost one foot in height. *P. divaricàta* produces light blue flowers from April to June, and grows about the same height as the former species. *P. ovàta* and *P. ovàta Listoniàna* grow about one foot high, and produce purple flowers from May to August, and *P. pilòsa* grows about one foot in height, and produces its pink flowers in May and June. There are above a dozen other species equally low in growth and prolific in flowers in spring or in the beginning of summer; and there are a number of species which grow from two to four feet in height, and flower in July, August, and September. Of these may be mentioned *P paniculàta álba*, and *paniculàta rúbra ; P. acuminàta*, which grows four feet high and produces pink flowers from May to August. *P. pyramidàlis* and its several varieties, *P. latifolia* and *P. maculàta*, grow four feet high, and produce pink or red flowers from July to September; and *P. múltiflorus*, which has a long spike of white flowers about a foot and a half high, flowers nearly all the summer. The only annual species is *P. Drummóndii* and its varieties, which are plants of surpassing beauty raised annually from seeds or cuttings in light sandy soil, and admirably adapted for covering flower-beds or growing in pots When raised from seeds, this species should be treated like a tender annual; and after being raised in a hotbed in February or March, it should be turned out into the open garden about the middle of May; or it may be sown in April or May in the open ground. In fine seasons it ripens seeds; but where it does not, *it may be* preserved through the winter by striking cuttings in autumn, and preserving them in pots placed on the front shelf of a greenhouse or in a frame. The varieties vary from purple to light rose, and generally come true from seed. On the whole, the genus Phlóx is one of the most beautiful of herbaceous plants, and a garden ought to be no more without some of the species than it ought to be without roses or bulbs.

Phœnix.—*Palmeæ.*—*P. dactylífera*, the Date Palm, is a well-known stove plant, which should be grown in a sandy loam. Young plants may be raised from the stones of the dates sold in the shops, and if kept in sufficient heat they will grow freely; though the trees must be of considerable age and size before they bear fruit.

Phormium. — *Asphodeleæ.* — *P. tènax*, the New Zealand flax, is a very singular plant, with large bunches of orange flowers, and very long, broad, lily-like leaves, the fibres of which are so strong, that they are used in New Zealand for making baskets, and various other articles in their coarse state, and in the same manner as flax for making sails, &c. In England the plant is at present rare, but it may be grown in a greenhouse in a very rich sandy loam frequently watered; the principal objection to its culture being the great size of its leaves, which occupy too much space for it to be grown in a small house.

Photinia. — *Rosàceæ.* — A very beautiful evergreen shrub or low tree, formerly called *Cratægus glabra*, which is nearly hardy, but thrives best when trained against a wall in a sheltered situation. The soil should be sandy loam; and the plants are propagated sometimes by cuttings of the ripened wood, but more frequently by grafting or inarching on some of the hardy kinds of Cratægus.

Phylica.—*Rhamnaceæ.*—Pretty little heath-like plants, natives of the Cape of Good Hope, with narrow leaves, and little terminal heads of fragrant white flowers, which begin to appear in autumn and continue during winter and early spring. They are generally grown in a greenhouse, and require the same treatment as the Cape heaths.

Physa'lis. — *Solanaceæ.* — The Winter Cherry. Dwarf shrubby and herbaceous plants, with showy flowers. The fruit is a bright red berry in a bladdery calyx; and when the calyx has been macerated by soaking it in water, it has a very pretty effect. Some of the species are shrubby, but the greater part are herbaceous plants; they are generally only half-hardy, and they succeed best when grown in sandy loam.

Physianthus.—*Asclepiadeæ.*—A climbing plant from Mexico, which has proved hardy in the London Horticultural Society's gardens. It has small whitish flowers, and very large and handsome fleshy seed-vessels, which look like oval gourds, and which, when opened, are found to contain the seeds enveloped in a quantity of fine silky substance, which looks like the cocoons of silk-worms, after the fine silk has been spun off. The Physianthus will grow in any common soil; but it should always be trained against a wall, as otherwise the large fruit will be too heavy for the slender branches.

Physoste'gia.—*Labiatæ.*—*P. imbricàta* is a beautiful plant, with pale purple flowers, nearly allied to Dracocéphalum, which only requires the usual treatment of hardy perennials. *P. truncàta* is an annual species with pale pink flowers. Both are natives of Mexico, and will grow in the open ground, in any common garden soil.

Phyteuma. — *Campanulaceæ.*—Herbaceous plants, generally with dark blue flowers, which will grow in any ordinary soil, and which are increased by dividing the roots.

Phytola'cca.—*Chenopodiaceæ,* or *Phytolaceæ.*—*P. decándra,* the Virginian Poke, is a fine vigorous-growing plant, which is ornamental from the abundance of its black berries, but which, from its large leaves and spreading habit of growth, requires a great deal of room. It should be grown in very rich soil, and it is increased by seeds or cuttings. There are several species, all of which have black berries, containing a deep red juice, which is said to be used in Portugal to colour Port wine.

Picottee. — A kind of carnation with a narrow dark-coloured margin to the petals, or with the petals covered with small brown or dark purple dots. For the culture, see Dianthus.

Pilewort. See Ficaria.

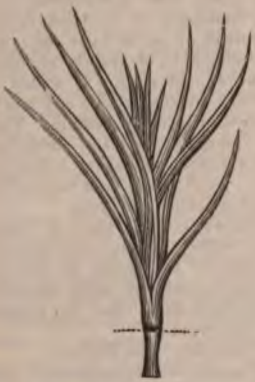
Pimele'a.— *Thymelaceæ.* — Australian shrubs which require a richer soil than most other plants from that country. They should be grown in a greenhouse in England; in a soil composed of sandy peat and loam, mixed with vegetable mould, or part of an old hot-bed. They should have plenty of light, and they should be kept regularly watered. They are propagated by cuttings.

Pimpernel. See Anagallis.

Pink. See Dianthus.

Pipings.—Cuttings of Pinks and Carnations are called pipings; because these plants have tubular stems; and when separated at a joint, the parts are pulled asunder, instead of being cut. This is done in autumn, by taking a shoot that has nearly done growing, in one hand, and pulling the upper part of it off just above a pair of leaves, so as to separate it at the socket formed by the axils of the leaves, leaving the part pulled off with a tubular or pipe-like termination. Some florists then cut off the tips of the leaves, but others leave them entire, as shown in fig. 23, and in both cases the pipings must be struck in sand with a hand-glass fixed firmly over them. It may be here observed, that the herbage of Pinks and Carnations is called the grass; and that when a plant is in a vigorous state of growth, it is said to have the grass fine.

FIG. 23.



PIPING OF A CARNATION.

Piptanthus.—*Leguminosæ*.— A handsome half-hardy tree with large yellow pea-flowers. It will grow in any common soil, but it requires a slight protection during winter.

Pista'cia.—*Terebinthaceæ*.—The Pistaccia Nut tree. Very handsome trees, which abound in turpentine in their native country, but which are only half-hardy in England.

Pits are structures either sunk in the ground, or raised above it with brick walls on all sides, and with a glass cover. For the purpose of *preserving plants* from the frost, they do not require flues, beds of tan or dung, or any other artificial mode of heating; but they do require artificial heat when they are employed for preserving greenhouse plants, for growing hothouse plants, or for forcing hardy herbaceous flowers or shrubs into premature bloom. They are also used as a substitute for hotbeds in bringing forward tender annuals, and in raising seeds. For all these purposes some mode of artificial heating is required; and this may either be accomplished by smoke-flues, the circulation of hot water in pipes of iron or earthenware, or by the introduction of beds of fermenting materials, such as tan or dung. The most convenient mode of heating is unquestionably by hot water, because by this mode there is less danger of producing excessive heat; and the heat from being accompanied by moisture, is more congenial to vegetation than the dry heat of smoke flues. Where hot-water pipes cannot be conveniently procured, or in the given locality are more expensive than smoke-flues, then these may be adopted; taking care to supply moisture to the atmosphere of the pit by placing pans of water on the flues; or by keeping the surface of the soil, or the path, if there be one, moist by the supply of water from time to time. The construction and the heating of pits are so well known to gardeners, builders, and ironmongers, that very little need be said on the subject. They may be of any convenient length—six feet, eight feet or ten feet in width, three feet high above the surface of the ground behind, and of such a height in front as that the slope of the glass may form an angle with the horizon of between 20° and 30°. The depth to which the pit is sunk in the soil will depend on the uses to which it is to be applied. When it is merely to preserve plants from the frost of winter, it need not be sunk into the soil at all; but when it is to contain a bark-bed, the depth of that bed, which may be between two feet and three feet, should be excavated from the soil. When the pit is to be entered by the gardener, in order that he may walk upright there should be a path immediately under the back wall, and this will require the pit to be at least seven feet in depth. In this, and in all other cases, sufficient drainage must be provided; and if the walls and floor are built and laid hollow, the entrance of moisture and the escape of heat will be prevented. In general, pits which are heated by tan or dung have the material placed in the beds inside; but in some cases it is placed around the pit, in what are called linings between two feet and three feet inside, and as high as the walls of the pit outside, so that the heat penetrates through the wall to the dung or soil within; and to facilitate this, the lower parts of the walls are built with open brickwork. Pits of this kind are called Macphail's pits, and are admirably adapted for growing hothouse plants, and for every description of forcing.

Pitcairnia. — ***Bromeliaceæ.*** — Handsome herbaceous stove plants, with pine-apple-like leaves, and very singular scarlet or pinkish flowers. They should all be grown in sandy peat and rich loam.

Pitcher Plant. See **Nepenthes** and **Sarracenia.**

Pitto'sporum. — ***Pittosporeæ.*** — Handsome evergreen bushy shrubs, which require a slight protection during winter. ***P. Tobira*** is a native of China, which has been known to live out of doors for several years in a sheltered situation, but which should be protected from very severe frosts. It should be grown in a rich light soil; and it is propagated by cuttings, which should be struck in sand under a hand-glass. Most of the species have terminal tufts of white fragrant flowers, and broadish shining dark green leaves; and they are all very ornamental.

Plantain Tree. See **Musa.**

Planting is the operation of inserting plants in the soil, either in the free ground or in pots. The simplest kind of planting is that which consists in removing small seedling plants, or such as have been struck from cuttings or layers; and this is commonly performed by making a round hole with a dibber, and putting in the root of the plant to the same depth as it had been covered with earth before, and making it fast by thrusting the dibber into the firm earth beside the hole and pressing it to the root. In this operation, the great art is to make the root fast at its lower extremity. Thus, in planting common seedlings of annuals or even cabbage-plants, if the earth be pressed close to the root at the upper part, and not at the extreme points, the success will hardly be complete; and in tender plants, or in a dry season, a failure will be the result. In planting plants of a larger size, a small pit should be opened by the spade or the trowel; the bottom of the pit having been formed into a cone or small hill, the plant should be placed in the centre, and the roots spread out equally over it on every side. The roots are then to be covered with soil gently pressed over them; and the operation must be finished by watering so as to consolidate the soil equally, without making it firmer on one part of the roots than another. If the soil should have been previously dug, trenched, or loosened to the depth of a foot, or probably two feet or three feet, the pit should not be made so deep as to throw the neck or collar of the plant below, or even on a level with the surface, when the soil is consolidated by watering. On the contrary, it must be left of such a height above it, as that when the soil is finally consolidated by its own gravity, influenced by the weather, the neck shall still be above the general surface of the ground, and the plant stand on a small hillock. This condition of planting cannot be too carefully attended to; for nothing can be more injurious to transplanted plants than having the neck buried more than it was in a natural state. Nothing is more common than too deep planting; and the temptation to it is the greater because deep-planted plants, from having the roots more accessible to moisture, are more certain of growing the first year, and are less in want of mulching to exclude the heat and drought, and of staking to prevent them from being moved by the wind. Hence, in planting trees or shrubs, it is of the greatest importance, not only with a view to their future growth, but also to their natural appearance above the surface, to have them planted on little hillocks, greater or less in height according as the soil may have been moved to a greater or less depth, either in the operation of digging the pit in firm soil, or in planting in soil which has been moved by digging, or trenching, or otherwise. In small gardens it is generally desirable, for the sake of producing immediate effect, to plant plants of considerable size; and in this case, in addition to the precautions which have been already mentioned, it is desirable to plant by what is called fixing with water. This operation is performed in the following manner: the hole being properly prepared, the plant placed in it, and the roots spread out on every side and extended as far as they will go, one person holds the plant upright, a second sprinkles earth *over the roots*, and a third supplies water from a watering-pot with a rose on if the plant be small, and without a rose if it be a tree of six feet or eight feet in height, holding the pot as high above his head as his arms will reach. The weight of the water coming down from such a height consolidates the soil about the roots, and fixes them in such a manner, as to render the plant, if it has been carefully taken up, almost in the same state as it was in before removing. Large trees or shrubs, if planted in this manner in the autumn, and staked, where there is danger from high winds, will grow, and even flower and fruit, the following year, as well as if they had not been removed. In this kind of planting with large plants, the hillock, left after the operation is finished, should not be less than a foot or eighteen inches above the surrounding surface; and to lessen evaporation during the ensuing summer, the hillock should, if possible, be covered with short litter, moss, turf turned upside down, or even small stones, for the first year. In staking large plants of this kind, the stakes should be placed close to the stem of the plant, in which position they are much less likely to injure the fibrous-roots than when placed at a distance from the tree; and the stakes should be made fast to the stem of the plant by a piece of straw or hay rope, or by a piece of twisted matting, or any kind of cord; the part of the stem to which the stake is tied, having previously had a small handful of straw, or moss, or mat, bound round it to prevent the tie from galling the bark of the stem, and preventing its increase during summer. These stakes should remain for a year or sometimes two years, according to the size of the plant and its facility of making roots. In general, the sooner the stakes are taken away the better; because the motion of the stem by the wind is essential to its increasing in thickness. In this matter much must be left to the discretion of the planter, who must always bear in mind that a staked plant is in a most unnatural position; and also, that if the tree should lean somewhat to one side for some years after planting, it will ultimately become more or less erect; and that a strong, vigorous-looking plant leaning a little to one side, affords a greater evidence of its being secure and in sound health, than a straight erect plant kept in that position by a stake. In the case of planting trees with stems three or four inches in diameter in exposed situations, two or three stakes may be used placed at a short distance from the base of the stem and leaning towards it; and where they are made fast, they should be joined by matting, hay-ropes, or some other soft material, so as not to injure or confine the bark. Before transplanting trees of a timber size, the main roots are frequently cut at the distance of five feet or six feet from the stem a year previously to transplanting; in consequence of which, they send out fibres which in the course of the summer become small roots, so that when transplanted, the tree, instead of drawing its principal nourishment from spongioles at the distance of twenty feet or perhaps thirty feet from the stem, is enabled to draw it from the distance of six or eight feet, and thus to continue growing, though not with the same degree of vigour as if it had not been transplanted. Some kinds of trees, when of a large size, such as the Sycamore, the Lime, the Horse-chesnut, and a few others, may be transplanted without this precaution; but in this case, the operation must be performed in autumn as soon as the leaves have dropped, in order to give the roots time to form some fibres during the winter; and the greater the distance from the stem at which the roots are cut, the greater will be the success. Large trees with wide-spreading roots when transplanted, seldom require to be staked, because the roots form a broad base, which prevents the stem from being blown to one side. Where there is danger anticipated from high winds, the tree may be secured by three guy-ropes tied to the upper part of the stem, and made fast to stakes driven into the ground at such a distance from the tree as that the ropes may form an angle with the ground of 45°; or the stronger roots may be kept in their position by stakes driven into the ground with their heads beneath the surface of the soil, the main roots being made fast to them by cords.

In all cases of transplanting deciduous trees, with the exception of the Beech and the Hornbeam, some pruning should be given to the top, so as to lessen the number of branches and leaves which are to be supplied by the root. The quantity of branches that are required to be removed will depend partly on the kind of tree, and partly on the intention of the planter, but mainly on the climate and soil. Beech trees, as already mentioned, are injured when transplanted by having many branches removed, and often die in consequence. Sycamores and all the Acer tribe, having numerous fibres near the main stem, require but little pruning of the head. The same may be said of the Yew and the Holly, the Lime and the Elm. When the object of the planter is to produce immediate effect by a bulky head, all the branches may be left on, whatever may be the kind of tree; but in that case the tree will produce only leaves for a number of years, or if it produce shoots they will not exceed a few lines in length. Ultimately, if the soil be poor and dry, the tree will probably perish; but if the soil should be good and moist, and the climate also moist, the tree will, in time, become vigorous, and produce shoots. Where the climate is moist, and the soil good, and also moist, any tree may be transplanted without pruning the branches; because the fibres it will produce in such a soil and climate will be sufficient to supply the moisture transpired by the leaves. But where the climate is dry and the soil also dry, no large tree can be safely transplanted with all its branches; because the transpiration by the leaves will be much greater than the moisture which can possibly be absorbed by the roots. Hence, in the dry climate of the Continent, all trees with stems above an inch or two in diameter have their branches entirely cut off, always excepting the Beech and Hornbeam, the Yew, and all the Pine and Fir, and Cypress tribes. Even in this country, in Evelyn's time, this was the practice; and the late Sir Joseph Banks, when he planted groups of trees with stems five inches or six inches in diameter on a portion of Hounslow Heath, which was allotted to his residence there, planted only stumps ten feet or twelve feet high, which stumps are now finely-headed trees, conspicuous from the road in passing Spring Grove. Much has of late been written on the subject of transplanting large trees by Sir Henry Steuart and others; and the practice has been recommended of leaving on the whole of the head. Experience, however, has proved that this can only be done with advantage under certain circumstances.

Planting in pots, when the plants are of the very smallest size, may be effected by a small dibber, as in planting in the common soil; but it is more frequently done on the principle of planting in pits; that is, the pot being *properly drained* by a few potsherds being placed over the hole in the bottom of the pot, and an inch or two of soil placed over them according to the size of the pot, the young seedling or newly-struck cutting is held with one hand, and soil sprinkled over the roots by a trowel with the other. When the pot is filled, the soil is consolidated by lifting the pot with both hands a few inches high, and setting down once or twice with a slight jar; afterwards supplying water so as to moisten the whole of the soil in the pot. The thumb, or a potting-stick, should previously be passed round the inner edge of the pot so as to firm the soil round the rim; otherwise the water is liable to run down round the edge of the pot, without moistening the soil in the middle. Immediately after planting, the pot should be set in a position where it can be shaded during sunshine; but on no account should tender plants be shaded during cloudy weather, or covered with an opaque covering during night, unless for the purpose of protecting them from cold. Of course the after treatment of every plant in a pot must depend on its nature; all that it is necessary at present to treat of is the manner of planting.

Transplanting plants which have already been grown in pots is either effected by removing the ball or mass of earth containing the roots entire, or by gently breaking the ball in pieces and stretching the roots out on every side. When the ball is not broken, the operation is called shifting. Plants are often reared in pots on account of their tender nature when young, or for the convenience of transporting them to a distance, though they are intended ultimately to be planted in the open ground. In almost all cases of this kind, the ball should be broken, and the pit having been prepared with the greatest care, as in common planting, the fibrous roots should be stretched out in it as far as they will go on every side. Hence, a plant which has been grown in a very small pot, when it is to be transplanted into the open garden may often require a pit three feet or four feet in diameter. There is not perhaps an operation in the whole circle of gardening that affords a higher gratification to the planter, than transplanting plants from pots when the pits and soil are properly prepared, and the roots carefully stretched out without being bruised or broken. In consequence of the extraordinary sources of nutriment which are thus afforded to the plant, and of the greatly increased power given to the roots, the shoots which it makes the first year are extraordinary, and evince a degree of vigour which none but a gardener of experience could believe possible. On the other hand, when a plant in a pot is turned out into a pit, however well the soil may be prepared, if the roots are not stretched out, it may remain for many years without growing much faster than it previously did in the pot. This is often the case with the more rare species of the Pine and Fir tribe, and with Magnolias and other plants kept in pots by nurserymen; and it is further attended by this evil, that the plants are easily blown to one side by the wind. In the case of surface-rooted plants, such as Pines, if they have been some years in the pot, they never send out roots sufficient to keep them upright; and hence the Pinaster and Stone Pine, which are almost always kept in pots in British nurseries, are generally found leaning to one side in plantations in this country. It is necessary, however, to make the distinction between plants newly planted in pots, and those which have been in pots for two or three years; for the former may perhaps have few roots which have reached the sides of the pot, as in the case of China Roses struck and potted early in the season and planted out the same summer, and which, of course, may be planted out without breaking the ball. The same observation will apply to all other plants in pots that have not their fibrous roots somewhat woody; and also to all hair-rooted plants, such as Heaths, Rhododendrons, Azaleas, Arbutus, and in general to all the Ericaceæ, which having at no age large woody roots, may always be transplanted from pots with the balls entire.

It may here be observed, that large shrubs of almost all the Ericaceæ may be transplanted at almost any age with less danger than most other plants, as from the slender and fibrous nature of the great mass of their roots, they are less liable to injury than woody-rooted plants. All that is required is that they should be taken up with a large ball of earth, and that when replanted they should be abundantly supplied with water.

Hitherto nothing has been said especially applicable to evergreens, whether in the open ground or in pots. These being at every season of the year more or less in a growing state, it is always desirable to transplant them with balls; and it is only young plants of evergreens, such as seedling Hollies, Portugal Laurels, and young cuttings or layers of the common Laurel, Laurustinus, Sweet Bay, Phillyrea, Alaternus, Junipers, &c., which can be sent to any distance with a certainty of growing without balls. The common Holly, when it is above three or four feet in height, requires to be taken up with a ball, and that ball carefully preserved by being tied up in a mat—or, according to the Dutch practice, put into a basket of wicker-work.

The same remark will apply to Arborvitæ, Junipers, Arbutus, Rhododendrons, Box, Phillyreas, and even the common Laurel.

The best season for transplanting all deciduous trees and shrubs is the autumn; because the plant has time to produce some fibres, and accommodate itself to its new soil and situation during the winter, so as to be prepared to grow freely the following spring. Evergreens may also be transplanted in autumn, or at any time in open moist weather during autumn, winter, or early spring. In dry or frosty weather it is always dangerous to remove them; because the sap in an evergreen is more or less in motion at every season of the year, and the plant is never so completely dormant as in the case of deciduous trees. Formerly it was thought that the best season for removing evergreens was in the latter part of summer, shortly after they had completed their year's growth; but this doctrine was only acted upon in the time of Miller and before, when there were comparatively few species of evergreens in British gardens, and it has been recently found by Mr. M'Nab, (see his *Treatise on Transplanting Evergreens*,) that evergreens may be transplanted with much greater safety in mild weather in autumn or winter, than at any other period of the year. Herbaceous plants may in general be transplanted at any season when they are not in flower or coming into flower; but the safest time for perennials is in autumn, after they have ripened their seeds and are going into a dormant state. Biennial and annual plants are best transplanted when quite young, or after they have obtained their second or third pair of leaves; and seedlings in general may be treated in similar manner. In all cases of *ting*, (excepting with Cacti and other succulents,) the plants should be watered as soon as they are fixed in their new situations; and when practicable, they should be shaded for a few days from the heat of the sun.

PLATYSTE'MON. — ***Ranunculaceæ.*** —One of the Californian annuals, with cream-coloured flowers and woolly glaucous leaves. For the culture, see CALIFORNIAN ANNUALS.

PLATYSTI'GMA.—***Papaveraceæ.***— A very curious little plant with the petals alternately white and yellow. For the culture, see CALIFORNIAN ANNUALS.

PLEASURE-GROUND is that portion of a country residence which is devoted to ornamental purposes, in contradistinction to those parts which are exclusively devoted to utility or profit, such as the kitchen-garden, the farm, and the park. In former times, when the geometrical style of laying out grounds prevailed, a pleasure-ground consisted of terrace-walks, a bowling-green, a labyrinth, a bosquet, a small wood, a shady walk commonly of nut-trees, but sometimes a shady avenue, with ponds of water, fountains, statues, &c. In modern times the pleasure-ground consists chiefly of a lawn of smoothly-shaven turf, interspersed with beds of flowers, groups of shrubs, scattered trees, and, according to circumstances, with a part or the whole of the scenes and objects which belong to a pleasure-ground in the ancient style. The main portion of the pleasure-ground is always placed on that side of the house to which the drawing-room windows open, and it extends in front and to the right and left more or less, according to the extent of the place; the park, or that part devoted exclusively to pasture and scattered trees, being always on the entrance front. There is no limit to the extent either of the pleasure-ground or the park, and no necessary connexion between the size of the house and the size of the pleasure-ground. A small house and a large garden was the wish of the poet Cowley; and the largest parks are sometimes attached to very small houses and small pleasure-grounds, and the contrary. A pleasure-ground in modern times differs from that prevalent at any former period in including all the scenes and sources of enjoyment and recreation of the ancient style as well as the modern. For example, adjoining the drawing-room front there is a terrace or terraces, with or without an architectural flower-garden, decorated with statues, vases, fountains, and other sculptural or architectural objects. Beyond this, or connected with it to the right and left, there may be a lawn with flowers, shrubs, groups of trees, ponds, lakes, rockwork, summerhouses, or greenhouse, an orangery, and sometimes a botanic garden. Walks may stretch away on either, or on both sides, to a shrubbery, which, in the present day, is commonly framed into an Arboretum and Fruticetum, containing all the hardy trees and shrubs which the extent of the scene will admit of: and in the course of the walk through this scene there may be rustic structures; such as woodhouses, mosshouses, roothouses, rockhouses, or cyclopæan cottages; Swiss cottages, common covered seats, exposed seats of wood or stone, temples, ruins, grottos, caverns, imitations of ancient buildings; and, in short, there is scarcely an architectural object capable of being rendered ornamental and a shelter from the sun, the wind, or the rain, which may not find a place. To know all the different scenes which may be introduced in a pleasure-ground in modern times, it is only necessary to visit such a place as Alton Towers, in Staffordshire, where, in addition to the objects mentioned, may be seen pagodas, hermitages, an imitation of Stonehenge and of other Druidical monuments, shellwork, gilt domes and huge blocks of mossy rock, bridges, viaducts, and many other curious objects. In small places of an acre or two, the most interesting objects which may be introduced in a pleasure-ground, are collections of trees, shrubs, and herbaceous plants, which may always be arranged to combine as much picturesque beauty and general effect as if there were only the few kinds of trees and shrubs planted which were formerly in use in such scenes. Where a small place, even of a quarter of an acre, is to be made the most of, there should seldom be more than one or two trees, shrubs, or plants of exactly the same kind; and the ornamental plants immediately adjoining the house may be combined with the verandah, portico or porch, conservatory, greenhouse or hothouses, terrace, flights of steps, balustrades, vases, statues, fountains, walks, rockwork, and a great variety of similar objects, according to the taste of the designer, the peculiarities of the situation, and the expense which the proprietor is disposed to incur.

Plectra'nthus.—*Labiatæ.*—East Indian and Australian plants, generally requiring a stove in England, and which are not worth the trouble it takes to cultivate them.

Plumbago. — *Plumbagíneæ.* — Lead-wort. Greenhouse plants, remarkable for their vigorous growth and abundance of flowers. They should be grown in light rich soil, and they are propagated by cuttings.

Podolepis.— *Compositæ.*— Very pretty Australian plants, which should be grown in a compost of loam and peat. They are all nearly hardy; the perennials are increased by dividing the root, and the annuals (*P. grácilis*, &c.) by sowing on a hotbed in

February or March, and transplanting into the open border in March.

Podophyllum.—*Podophyllaceæ.*—The May Apple, or Ducksfoot. An American herbaceous marsh plant, which should be grown in a light rich soil kept moist, and which is increased by seeds or dividing its creeping roots. The flower is white, and the fruit, which is eatable, is green and about the size of a plum.

Poet's Cassia.—See Osyris.

Poinciana.—See Cæsalpinia.

Poinsettia.—*Euphorbiaceæ.*—A most splendid plant, not for its flowers, which are small and white, but for its large bright scarlet bracteas, which, at a little distance, have a superb appearance. There is a variety with white bracteas, but it is very inferior to the species. This plant requires a stove, in which it should be grown in a compost of loam and peat. After it has shed its leaves, it should be allowed a season of rest, during which it should be kept nearly dry. It is increased by cuttings, which, when taken off, should be dried for a few days, and then plunged into the tan of a pine pit or stove.

Poivrea.—*Combretaceæ.*—This new genus, established by Professor De Candolle, includes all those species of the genus Combretum which have ten stamens and five-angled seeds; the type being *Combretium purpurea*, (*Poivrea coccinea* Dec.) For the culture, see Combretum.

Polemo'nium.—*Polemoniaceæ.*—Greek Valerian. The common wild species, *P. cæruleum*, is very abundant on the dry sandy banks in the lanes near Shenstone, in Staffordshire, where it is called Charity, though its common name in other parts of England is Jacob's Ladder. All the kinds succeed best in gravelly or chalky soil, and they are all increased by dividing the roots.

Polia'nthes.—*Hemerocallideæ.*—The Tuberose. A bulbous-rooted plant, a native of the East Indies, remarkable for its highly odoriferous white flowers. The bulbs are imported from Italy, where they are grown for exportation as Hyacinths are in Holland. They require to be brought forward in a frame or pit; and when coming into flower, they should be removed to a greenhouse or any cool airy apartment, where they will diffuse a powerful fragrance which to some is grateful and to others oppressive. They should be potted in sandy loam; and if the bulbs are intended to flower the second year, the plants should be replaced in heat close to the glass, and kept there till the leaves begin to decay; after which the bulbs may be treated like those of the Hyacinth. It is rarely, however, that this can be done with success, and it is therefore better to throw the plants away when they have done flowering, and purchase fresh bulbs every year. In pleasure-grounds of limited extent, a few plants of Tuberose in flower, distributed over them at distances of fifty or one hundred yards plant from plant, will diffuse a most delightful fragrance in the summer and autumnal evenings; a circumstance well understood in the public gardens in the vicinity of Paris.

Polya'nthus.—See Pri'mula.

Poly'gala.—*Polygàleæ.*—Milk-wort. Very handsome greenhouse shrubs, natives of the Cape of Good Hope, which should be grown in a compost of two-thirds peat, and one-third of very sandy loam; or equal parts of peat and sand, with one-third of vegetable mould may be used. The plants should be frequently watered; but the water should not be suffered to remain in a stagnant state about the roots. When it is wished to raise young plants, the tips of the shoots should be taken off about three inches long, and struck in sand under a bell-glass. All cuttings of the shrubby Polygalas are very apt to damp off; and therefore the glasses should be frequently taken off and wiped. There are other kinds of Polygala, natives of Europe, which are herbaceous perennials; and others which are natives of North America, some of which are annuals and some perennials. All the herbaceous Polygalas are hardy dwarf plants, very suitable for rockwork; and they may be grown in any common soil, though they prefer peat or very sandy loam. Some of the kinds of Polygala are now included in the genus Murâltia, the type of which is ***P. Heistèria;*** and others in the genus Mundia, the type of which is ***P. spinòsa.***

Polygona'tum.—***Smilaceæ.***—Solomon's Seal. Hardy perennial plants, which require no other care than planting in any common garden soil. They will thrive either in exposed situations, or under the shade of trees, but the flowers are generally largest when the plants are grown in the shade.

Polygonum.—***Polygoneæ.***—This is a very extensive genus, and embraces a great many very different plants; some of which are British weeds, and others stove-plants from the East Indies or New South Wales. Some of the commonest kinds in British gardens are, the Buckwheat (***Polygonum fagopyrum***), the garden Persicaria, (***P. Persicaria***) and the water-pepper, (***P. Hydropiper***), the beautiful pink flowers of which are so ornamental in the ponds in Kensington Gardens, and other places. Plants so various in their nature, require of course different kinds of soil and situation; but they will all grow in sandy loam, and are generally of the easiest culture.

Polypo'dium. — ***Cryptogamia Filices.***—An extensive genus of very beautiful ferns, some of which are natives of Britain, and others are exotic. All ferns should be grown in shady, damp places; and the hardy ones thrive most in a shrubbery under the drip of trees, where few other plants will grow. The exotic kinds should be grown in a stove glazed with green glass; and the atmosphere should be kept damp by water being frequently poured on the floor and flues.

Pomade'rris. — ***Rhamnaceæ.*** — Australian shrubs with cymes of yellow flowers and generally woolly leaves, nearly allied to Ceanòthus. They are very nearly hardy, and may be grown in the open air with a little protection during winter. They should be grown in sandy peat, or in a mixture of peat and loam; and they are propagated by cuttings.

Pomegranate.—See Punica.

Pontede'ria.—***Pontederaceæ.***—Stove aquatics that should be planted in rich loamy soil, and the cistern filled up with water. They are increased by dividing the roots.

Ponthieva.—***Orchidaceæ.***--Stove Orchideæ, more curious than beautiful, which are usually grown in pots. —See Orchideous Epiphytes.

Poppy.—See Papaver.

Pora'na.--***Convolvulaceæ.***--Stove climbing plants, with white flowers. Some of the species are now included in the genus Dinètus.

Porcupine Cactus.—See Echinocactus.

Portlandia.—***Rubiaceæ.***—Stove shrubs, natives of Jamaica, with very showy flowers. They should be grown in sandy peat or very sandy loam. In Jamaica these plants grow on calcareous rocks, where they form low trees, with large and beautiful tube-shaped flowers, which are delightfully fragrant. There are but two species known, one of which has white the other scarlet flowers, and the both propagated by cuttings in sand, under a bell-glass, and plunged into bottom heat.

Portugal Laurel.—*Cerasus Lusitanica.* — A handsome evergreen shrub, which thrives best in moist shady situations, and which sometimes attains the size of a tree. In Ireland, Portugal Laurels attain an enormous size, the moisture of the climate suiting them admirably.

Potamogeton. — *Alismaceæ.* — Pondweed.—British weeds, one or two species of which are ornamental; as for example, ***P. ruféscens, P. lùcens***, and ***P. nàtans.***

Potenti'lla.—*Rosàceæ.*—A genus of herbaceous plants, and one or two shrubs, the greater part of which are ornamental, and some eminently so. They all thrive in any common soil, and are readily increased by division of the plants, or by seeds, which most of them produce in abundance. They also hybridise freely, from which new kinds are frequently raised by Florists. The principal shrubby species is ***Potentílla fruticòsa***, which forms a hardy bush, commonly between two feet and three feet high, and produces abundance of yellow flowers in July. The most ornamental herbaceous species are, ***P. Gunthèri, P. Sieversiàna***, and ***P. Thomàsi***, with yellow flowers; ***P. cròcea, P. atrosanguínea pedàta***, with copper-coloured flowers; ***P. formòsa Gesneriàna***, with yellow and red flowers; ***P. formòsa Mayàna*** and ***P. Hopwoodiàna***, with pink and white flowers; ***P. álba, P. glabra*** and ***P. rupéstris***, with white flowers; ***P. atrosanguínea fúlgens*** and ***P. a. ignéscens***, with crimson flowers; ***P. atrosanguínea*** and ***P. formòsa***, with deep red or purple flowers, which are produced from May to August; and ***P. Russelliana*** and ***P. atrosanguínea coccinea***, with dark scarlet flowers. All these species are low, few of them exceeding one foot in height, and the greater part not being above six inches. They are delightful plants for pots or for rock-work, and the whole are so hardy and of such easy culture that they will bear neglect better than most other inhabitants of the border or the flower garden. Of all the kinds, ***P. Russelliana***, with rich dark scarlet flowers, is by far the handsomest.

Potting.—The subject of potting plants may be considered in two ways: first, with reference to the advantages of that mode of growing plants as compared with growing them in the free soil; and secondly, with reference to the performance of the operation of potting. Plants growing in pots are placed in very unnatural circumstances, from the limit given to the extension of their roots by the small quantity of soil and the confined space of the pot; and by the circumstance of the outside of the pot being constantly exposed to the action of the air on every side. In consequence of these conditions, the roots of plants in pots are alternately scorched, and cooled, and dried by the action of the atmosphere; and as, to keep the plants alive, they require to be frequently watered, the soil soon becomes soddened, or soured as it is called by gardeners, and the plant is either checked in its growth, or becomes diseased. Nevertheless by well-considered treatment plants may be grown in pots to a high degree of perfection, and some kinds better than in the free soil. For this purpose two things are more especially requisite; the first is to provide sufficient drainage for the escape of superfluous matter; and the second is to cover the sides of the pot by some medium which shall prevent the action of the surrounding air in heating or drying the outside of the pot, and consequently the soil and roots within. Every pot, tub, or vessel, in which a plant is grown contains a hole or holes in the bottom or lower sides; and these are to be prevented from being closed by the soil by a covering of potsherds, shells, or small stones, covered with turfy matter, over which the soil in which the plant is grown is to be placed. To prevent the sides of the pot or vessel in which the plant is grown from being scorched or dried by the heat of the sun, the pot is plunged in soil, or in moss, or some other porous matter, or the pots are placed sufficiently near together to shade one another. Different kinds of plants require different degrees of drainage, and of protection from the sides of the pot. For example, all Orchidaceous plants, succulents, and hair-rooted plants, such as the Ericaceæ, require a great deal of drainage; and all plants which require rich moist soil, such as the Scitamineæ, and many of the most vigorous-growing tropical herbaceous plants, require the sides of the pot to be protected by plunging it in tan, sand, ashes, soil, moss, or some other nonconducting medium, which shall not be readily permeable by drought or heat.

With respect to the operation of potting plants, when seedlings or plants newly rooted by cuttings, layers, or other means, are to be potted, a small pot is chosen, either of the least size, or of a size somewhat larger, according to the bulk of the plant to be planted, or its known vigour of growth. The hole in the bottom of the pot being covered with one or more potsherds, and with some rough turfy, rooty, or mossy matter, or with coarse gravel, some soil is put in over it. On this the roots of the young plants are placed and spread out, and soil is placed over them till the pot is filled, as before mentioned under the article PLANTING. The soil in the pot is then consolidated by shaking, and lifting it up, and setting it down once or twice with a jar, the soil round the edge of the pot being rendered firm by the thumb, or by a stick as already mentioned. Plants of larger size without balls of earth attached to the roots are planted exactly in the same manner, excepting that the pots chosen are larger, in proportion to the size of the plant. Plants which have grown in the free soil during summer, such as Pelargoniums, Fuchsias, Myrtles, and such other plants as are turned out of pots into the open garden in the beginning of summer, and taken up and repotted about the latter end of autumn, are commonly taken up with balls; and, when this is the case, the pot chosen must be of sufficient size to admit of the ball of earth without breaking it. Previously to the taking up of these plants, more especially when they have grown with great vigour, it is found advantageous to cut the roots all round about the same distance from the main stem, as the size of the ball was when put into the ground, by which means the plant receives a check before it is taken up, and is prepared to endure the still greater check which it will unavoidably receive when potted. This precaution is more especially requisite for such strong growing plants as the Brugmansias, Fuchsia fulgens, Scarlet Pelargoniums, Stocks, Wallflowers, &c. All plants after being newly potted should receive a sufficient quantity of water to moisten the whole of the soil in the pot; and all of them require to be shaded, to prevent excessive transpiration till they have begun to grow.

Plants in pots which are to be transplanted into other pots with the ball entire, require comparatively little care. The new pot should be at least one size larger than the old one out of which the plant is to be taken, and, being properly drained, and some mould put over the drainage, the plant to be changed is turned out of the first pot by turning it upside down, holding the left hand on the surface of the soil in the pot, and with the neck of the plant between the two middle fingers, while the bottom of the pot is held with the right hand; and then the ball is loosened by the edge of the pot being struck against any fixed object, such as the side of a potting bench, or the handle of a spade stuck in the ground. The ball containing the plant will thus drop out into the left hand, and the potsherds that have come out with it being taken off with the right hand, the ball thus prepared is set in the middle of the prepared pot, and the interstices between the ball and the sides of the new pot are filled in with earth and made firm by a potting-stick. The pot may then be lifted up with both hands and set down two or three times with a jar, so as to consolidate the whole. The pot is then to be supplied with water to such an extent as to moisten the whole of the earth which it contains; and it may be set where it is finally to remain without the necessity of shading. This operation is called shifting.

In potting plants, whether in small or in large pots, it is essentially necessary that the inside of the pot should be perfectly clean and dry. If it is not clean, and if particles of earth are adhering to the sides of the pot, the fresh soil put in when the plant comes to be shifted will so adhere to the matter attached to the sides as to prevent the ball from being turned out without breaking, and tearing asunder the fibrous roots of the plant. When the sides of a pot in which a plant is to be planted, or a ball shifted, are wet, the new soil soon becomes sodden or soured, and also adheres so firmly to the sides of the pot as not to come out in shifting without breaking, as in the preceding case. The soddening or souring in this latter case appears to proceed from the choking up of the pores of the sides of the pot.

Potsherds or Crocks, are pieces of flower-pots, tiles, or bricks, broken very small, and used for draining pots where it is required to retain a certain degree of moisture round the roots of the plants. Thus potsherds should be used for hair-rooted plants, such as the Cape and Australian shrubs, and also the North American Rhododendrons and Azaleas; as they require to have their roots kept in an equable state of moisture, which would be destructive to the Cacti and other similar plants. But cinders, when of a large size, are very useful in draining pots for very delicate succulent-rooted plants, as they do not either absorb or retain moisture, which crocks always do. When cinders are sifted, the largest may be reserved for this purpose, and the ashes that fall from them, or any coal too small to burn, will be useful for setting greenhouse plants on during summer, as they will prevent worms from coming out of the ground under them. Unless this precaution be taken, worms will creep through the holes at the bottom of the pots, and do great injury to the plants, by tearing asunder the tender fibres of the roots in passing through the mould, and particularly in throwing up their casts.

Potting-Stick. — An instrument made of wood, and resembling a paper knife, but thicker and blunter at the extremity. Its use is to push the earth into the pots when plants are shifted or transplanted, and it prevents the necessity of using the thumb for that purpose, as is generally done by gardeners. Potting-sticks may be made of different sizes according to the size of the pots.

Prickly Pear.—See Opuntia.

Primrose.—See Pri'mula.

Pri'mula.— *Primulàceæ.* — The

Primrose. This genus includes three of the most popular and beautiful of florists' flowers, viz., the Auricula, the Polyanthus, and the Primrose. Of each of these there are numerous varieties, and much has been written on their culture and management. We shall here endeavour to give a short outline of the treatment of each.

The Auricula (***Prímula Auricula***) is a native of the Alps of Switzerland, where its flowers are commonly yellow and very fragrant; it may be gathered in abundance on the roadside on the highest part of the pass of the Simplon, growing with the different Saxifrages, and not far from *Rhododéndron hirsùtum*. When it was transplanted into gardens is uncertain, but it has been cultivated in Britain since the days of Gerard, in 1596; and in a state of cultivation its flowers are yellow, red, blue, purple, white, and green, and single and double, though the only double variety has the flowers yellow. Many elaborate directions have been given for preparing the soil for the Auricula; and while some writers, as Justice, recommend rotten willow-wood and old cowdung, others, as Emmerson, recommend bullock's blood, sugar-baker's scum, and concentrated night-soil. The plants, however, will grow and thrive on any rich loamy soil, for example, in a mixture of leaf-mould or thoroughly rotten cowdung and loam. They will even grow very well in heath soil mixed with loam; and this is the soil in which they are commonly grown in the neighbourhood of Paris. Whatever kind of manure is used for the Auricula, it should be so thoroughly decomposed as to have become a fine mould, and, in this state, it may be mixed with the common soil of gardens in equal parts, with the addition of a fifth or a sixth part of coarse sand if the plants are to be grown in pots. All the choice varieties of Auricula are grown in pots, and kept under cover in glass frames shaded; or placed in a northern exposure during winter and spring, and in the open air in a situation open to the east or the west during summer after the flowering season is over. During the time they are in flower, they are commonly kept in frames close under the glass, or under hand-glasses to protect the flowers from the rain; the flowers in all the varieties, and the leaves in some, being more or less covered with a powdery bloom, the preservation of which is a desideratum among choice cultivators. The Auricula is propagated by division of the root, or by cutting off slips which have generally some roots attached, and are put at once into small pots. The season for performing the operation is shortly after the flowers have gone off, or, if they are left on, immediately after the seed has ripened. There are common kinds of Auricula which are planted in borders or in beds in the open ground; but, as before observed, all the choicer sorts are grown in pots and kept in pits or frames. The culture requires so much care and nicety, that whoever would excel in it, and possess a good collection, should procure a book specially devoted to the culture of this and other florists' flowers; for example, to Hogg's ***Treatise on the Auricula***, or Maddox's ***Florist's Directory***. Auriculas when grown as florists' flowers have almost innumerable names; but they may be all divided into three classes, viz., those with green edges, those with grey edges, and those of only one colour, which are called selfs. No Auricula is valued that is what is called pin-eyed, that is, if the style and stigma appear above the anthers.

The Polyanthus (***Prímula vul-***

gàris, var. *cauléscens*) and the Primrose (***Prímula vulgàris***, var. *acaùlis*) are cultivated in the same soil and in the same manner as the Auricula; but being much hardier, and also naturally stronger, a larger proportion of loam is used in the soil, and only the more choice sorts are grown in pots. Both Polyanthuses and Primroses form most ornamental border flowers in early spring, but only the Polyanthus is what is properly called a florists' flower. The colour of the flower of Polyanthus is always yellow and brown, and the finest flowers are those that have the segments of the corolla flat, and the circumference marked with a yellow line, the anthers of the stamens being only visible, and not the pistil, the anthers being arranged symmetrically so as to form what florists call a none eye. Sometimes the anthers are not seen, but the style and stigma stand up conspicuously like a large pin, and when this is the case, the flowers are called pin-eyed, and are considered worthless. The double Polyanthus, and the red and white Hose-in-hose Primrose, are two varieties having double corollas, which may be called botanists' varieties, and are ornamental border flowers, but are not valued by florists. Besides these, however, there are a great many florists' varieties with names, which are cultivated in pots like Auriculas.

The Primrose is very ornamental as a border flower, but it has not sported so much as the Polyanthus, and there are therefore no florists' primroses. The border or garden varieties, however, which are mostly double, are very showy; among these the double flesh-coloured, double white, double brimstone, double red, double copper, double dark purple, and double violet, deserve a place in every garden. The single white and the single red, both of which are found wild, are also much admired, and are valuable as coming into bloom in March.

Prímula elàtior, the Oxlip, has a scape or flower-stem rather taller than that of the Polyanthus, but the flowers are not so large. There are a number of varieties, but none of them have been selected and named.

Prímula vèris, the Cowslip, bears a close resemblance to the Oxlip, but is more commonly found with the flowers yellow than red, and like the Oxlip it is a pretty border flower. The Polyanthus, the Primrose, the Oxlip, and the Cowslip, are all species of the same genus, and fecundate one another readily, so that an endless number of varieties may be raised from seed. Where there is room and leisure, this affords a great source of interest to the amateur, who, as every plant comes into flower for the first time, is eager to observe whether it presents anything new, and if new, good. When a gardener raises these plants from seed, and finds his labour and anxiety rewarded with a good variety, he is delighted, and probably gratifies himself by calling it some high-sounding name, and promising or exchanging plants of it with his friends. The seeds may be gathered when the capsules are ready to burst in July, and sown immediately in a shady border, or in pots or pans of loamy soil kept moist and shaded. The covering should be very slight, otherwise the seeds will not come up. In fine seasons seeds sown as soon as they are gathered, will produce plants which will flower in the following autumn; but in general it is necessary to wait till the next spring. When the seedlings have produced two or three leaves, they should be transplanted into rich loamy soil in a shady situation at the distance of a few inches from each other; and as they come into flower the good sorts should be marked, and the less admired kinds pulled up and thrown away. When the seed is not sown immediately after being gathered, it may be kept till the following March, and treated as above mentioned. Auricula seed requires exactly the same treatment; excepting that it is generally sown in pans of soil composed of a mixture of leaf-mould and loam, and the seedlings are transplanted into larger pans, or into single small pots. The seed of common border Auriculas may be treated like that of the Polyanthus or Primrose.

Primula cortusoìdes is a very ornamental species, which produces its red flowers from May to July; it requires a loamy soil, kept moist, and a shady situation, and therefore cannot be treated like a common border flower.

Prímula decòra, P. nivàlis, P. villòsa, P. marginàta, P. helvética, P. farinòsa, P. Palinùri, P. scótica, and several others, might be named as rare and beautiful species, natives of alpine regions, and requiring to be cultivated with care in loamy or peaty soil, kept moist, in an open and airy, but yet shady situation.

P. prænìtens, the Chinese Primrose, is a very beautiful greenhouse plant, of which there are varieties with pink, with white, and with semi-double flowers. All these are particularly valuable, as forming neat little plants and flowering throughout the winter. They are propagated by seeds which generally come true to the variety; or by cuttings which must be struck in sand under a bell glass, and with bottom heat. They are only biennials, and therefore new plants require to be raised every year. They are generally grown in pots, which should be well drained with potsherds, and filled up with a rich compost of equal parts of loam, peat, or sand, and rotten dung or vegetable mould.

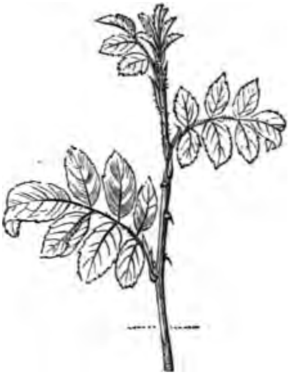
PRINCE'S FEATHER.—*Amarantus hypochondriacus.* — See AMARANTUS.

PRI'NOS.— *Rhamnaceæ.* — Hardy North American shrubs, that will grow in any light soil, though they prefer peat, and any situation. They are generally propagated by layers.

PRIVET.—See LIGUSTRUM.

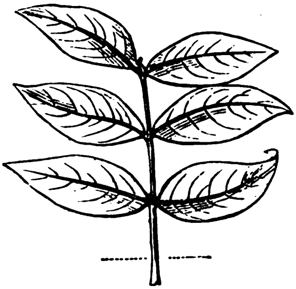
PROPAGATION.—The tendency of all plants is to multiply themselves most commonly by producing seeds, but frequently also by the extension of bud-bearing roots under ground, and by root-bearing shoots above ground, or, in other words, by runners, suckers, and offsets. In propagating by seeds, all that is necessary is to collect them when ripe, and either to sow them immediately, which may in general be done with the seeds of all indigenous plants in their own country, or, what is safer, preserving them till the following spring. The seeds should generally be sown in a somewhat lighter and finer soil than that in which the parent plant thrives; and the covering should be two or three times the thickness of the seed, the soil being gently pressed down before sowing, and the seeds being thinly distributed and gently pressed into the soil before being covered. This gentle pressure, first of the soil, and afterwards of the seeds, prevents any of the latter from being too deeply buried and consequently lost, and prevents them also from being unequally covered. All round seeds sown and covered in this manner will be found to come up; while many of those sown in loose soil, and covered loosely without pressing, will be found to be lost. Surface runners, such as those of the Strawberry, and underground runners, such as those of the Mint, require merely to be cut off and planted; and suckers an offsets are, in like manner, separated from the parent plants and planted by themselves. The artificial modes of propagation are by layers, cuttings, budding, and grafting; and all these modes are founded on the principle, that a bud is equivalent to a seed, and, with certain exceptions, will, when suitably treated, send down roots from one extremity, and send up shoots from the other. Sometimes the bud can be separated from the plant without any portion of its stem or root, as in the case of bulb-bearing stems; but most generally, it is necessary to have a portion of the wood or stem taken off along with the bud, as in the case of propagating by cuttings, layers, grafting, &c. In the case of budding, a smaller portion of the wood or bark of the parent is required than in any other case, excepting that of propagating by bulbs, which are nothing more than detached self-supporting buds. As plants have sometimes what are called adventitious or dormant buds, which are called into activity by particular circumstances, some plants may be propagated by portions of the roots, leaves, or branches, on which no bud is apparent, as in the case of the roots of the Rosaceæ; the leaves of some species of Cardaminè, Gloxinia, &c. and the branches of the Willow. In general those roots which abound in milky juices, as Ailántus, Rhús, Catálpa, Euphòrbia, Nuttàlia, Papàver, Mòrus, Maclùra, &c., will produce buds much readier than dry roots, such as those of the Oak, of which only one species, the Quércus Taùzin, grows by cuttings of the roots. In propagating by eyes or buds, some florists strike their Pinks by reducing the cutting, or piping as it is called, to the topmost joint, and *cutting* away all the leaves close *above* the central bud; the cuttings are afterwards planted in a layer of sand on the top of a bed of rich compost, and covered with a hand-glass. Any species of Diánthus, or any kind of grass or reed, may be struck in the same manner. Success is most certain in fine sunny weather, as it depends on the excitement of the vital energies of the bud; and though it has no leaves to nourish it, yet in dry sunny weather it will strike sooner than a piping with the leaves left on, which grows best in dull cloudy weather. In propagating by leaves there is little that can be depended on in a practical point of view; and therefore this mode of increasing plants must be looked on more as a curiosity than as any useful mode. The propagating by cuttings much depends on the manner in which they are formed, and the state of the weather: if this should be dull and cloudy, cuttings with the leaves on will succeed best; but if it should be dry and sunny, cuttings with few leaves covered with a hand-glass so as to exclude the air are to be preferred. A cutting with only two or three leaves, and these perhaps mutilated, is similar to an eye or bud, and requires to be excited; while a cutting with all its leaves on will perish from excessive transpiration, if much excited. A great deal of the success of cuttings depends on their being well pressed by the medium in which they are inserted; they will grow squeezed to the sides of the pot, and are found to succeed best when pressed against it. When planted in the open ground, they should be firmly pressed at their lower extremity; as when pressed towards their middle they will in some cases strike root at that part of the cutting, while all below it will decay; and in other cases the whole cutting will rot. The depth to which cuttings are inserted, depends upon whether they are of the old or young wood. If the former, they should

FIG. 24.



ROSE CUTTING, READY FOR PLANTING; THE DOTTED LINE SHOWING THE GROUND.

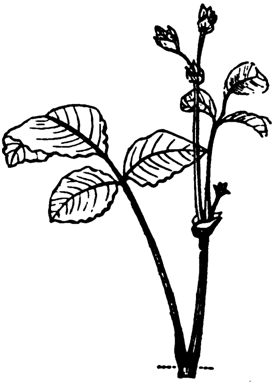
FIG. 25.



A CUTTING OF A MYRTLE PREPARED FOR PLANTING, THE DOTTED LINE SHOWING THE GROUND.

be buried at least half the distance between the joints, as shown in Fig. 24, of the cutting of a China Rose, and in Fig. 25, of a myrtle. In cuttings of the young wood, on the contrary, where the wood is soft and succulent, it is better to bury only the joint in the ground, as shown in Fig. 26, of a Kennedya, where cuttings are likely to be difficult to strike, the end may be slit as is often done with cuttings of an Orange. In general, the best time for taking off cuttings is when the young shoot is in the act of extending itself by growth; because the vital principle is then in a state of greater activity, and the swelling of the circular matter at the lower extremity of the cutting, or callosity as it is called by gardeners, from which the roots proceed, is sooner formed. It is of great consequence with all cuttings, where circumstances will admit, to preserve that part of the shoot which joins the stem; because this base, or callosity as it may be called, contains a nucleus of adventitious buds and fibres, from which roots are more readily protruded than from any other part of the cutting.

FIG. 26.



CUTTING OF THE YOUNG WOOD OF A KENNEDYA.

In propagating by layers, the slit in the layers should be made just below a bud on the shoot, as described under the head LAYERING, but without detaching the shoot from the parent plant; and the part above the slit should be fixed in the ground as perpendicularly as possible, in order to check the sap, and cause it to accumulate in that part of the layer which is cut, and from which the roots are to proceed.

The success of budding depends greatly on the state of the stock. If this is growing vigorously, and the bark rises quite freely on the introduction of the budding-knife, the budding can hardly fail of success; but if the young shoots of the stock are nearly ripened to their summits, the bark is likely to adhere to the wood, and the operation of budding to be unsuccessful. Much of the success both of budding and grafting depends on performing the operation as speedily as possible. In grafting, the great art is to keep the newest layers of wood in the inner bark of the stock and the scion closely united, and firmly pressed together; and for this purpose they should both be as near of a size as possible, and the slice cut off from each should be very small, allowing as much of the alburnum as possible to remain on both. The scion should not be put on the stock till the latter has begun to grow; and for this reason it is always advantageous to cut off the scions from the parent plant a month or more before the grafting season, and to preserve them by inserting their ends in the soil in a shady situation. If this is neglected to be done, and the sap is in motion before the scion is cut off, the check which it will receive is such as effectually to prevent it from uniting with the stock, however expertly the operation of grafting may be performed. After all that can be written on grafting, nothing will insure success if the operator has not had
xperience; and therefore in this
the operations of gardening the amateur will gain more by a few minutes' observation of what takes place in a nursery, or by an experienced gardener, than by reading volumes of well-written treatises; though the latter are useful in teaching principles and calling to mind the modes of practice.—See Seeds, Cuttings, Layers, Graftings, &c.

Props are artificial supports for plants; and they are of various kinds, according to the nature of the plant that is to be supported. Twining plants are supported by single rods, stakes or poles without branches; plants which climb by tendrils are supported by branched rods; and plants which raise themselves by elongation or long slender shoots among other plants are supported artificially by branched rods, or by being tied to simple rods. All these kinds of plants when too tender to be supported in the open garden, are trained to walls, which are the universal supports of plants, whether of the hardy and ligneous kinds, or of such as are slender, somewhat delicate, and either naturally climbing, such as *Bignònia capreolàta*,—or rambling or trailing, such as different kinds of roses. Ornamental plants grown in pots are sometimes supported by single rods of wood, or of iron or wire, (see Figs. 7 and 8) and sometimes by small frames either of wood or iron. These frames may either be flat and of equal breadth from the surface of the pot upwards; or they may be widest at top, which suits most sorts of climbers; or they may be made in the form of cones, pyramids, inverted cones, or balloon-like shapes, at pleasure. (See Fig 22, in p. 178.) A very common form for such plants as *Tropæolum pentæphýllum*, *T. tricolòrum*, and *T. brachycèras*, is that of an elongated fan; and another is that of a shield-like figure with the narrow end at the pot.

In general all plants grown in pots should have the support of a regular or symmetrical shape; and all those grown in beds or borders, such as Sweet Peas, the common Tropæolum, (Nasturtium), the Scarlet-runner, &c., should have small branchy stakes inserted in the soil in a regular manner, so as never to appear the work of chance or of carelessness, but of art and careful design. Climbing roses may either be supported by training against walls or trellis-work, or on single rods, with expanding parasol-like tops of wire-work; or they may be supported on cones or pyramids of rods or poles. The stronger-growing climbing Roses, which attain the height of twenty feet, or thirty feet, or upwards, such as the double Ayrshire Rose, the Rose de Lille, the Boursault, *R. Macrantha*, Cassoretiana, Brooke's Climbing, Noisettes, &c. may be supported on cones or pyramids two feet or three feet in diameter at the ground, and rising to the height of twenty feet, formed of the stems of young Fir trees tied together: tender roses, on the other hand, such as *Ròsa Bánksia*, the Musk Rose, require to be trained against walls. Props for border-flowers may either be small rods made by splitting the laths used by plasterers or by carpenters from deal-board; but perhaps the best mode, because least artificial and ostentatious, is that of using straight rods of hazel, or some such wood, with the bark on. The object in using the rods of this kind is not so much to avoid the appearance of the use of the instruments of the carpenter, as to avoid the conspicuousness which is the result of all artificial props, and especially of such as are not painted green. The principle to be taken as a guide is, that the rod should always be subordinate to the plant to be supported by it or trained on it. If this principle is kept constantly in view, few glaring errors will be committed either in forming supports for plants in pots, or for plants in the open ground. Hence walls on which plants are to be trained should never be built of bright red brick, or very white stone; or if they are plastered, the colour should always be of a subdued kind. Some plants are trained up rods or cones for the sake of producing flowers; and others, such as Ivy, when trained up an erect rod with an umbrella-like top for the sake of producing shade. When the object is flowers during the whole extent of the plant, the prop should always be wider at the base than at the top, in order that the foliage may enjoy the direct influence of the sun and of perpendicular rains during its whole extent. When the flowers are chiefly to be produced at the top, and the object of the stem is merely to elevate the top to a considerable distance from the ground, then the latter must spread over the former as much as may be desirable for the sake of effect. In like manner, when the object is shade, or the covering of a summer shelter or a bower, the stems may be trained upright and may be shaded to any extent by the head.

Wire frames for training plants in pots are generally painted green; but a more artistical colour would be that of stone or of the bark of trees, or of young rods; because green too much resembles nature, and the object in imitating nature ought never to be to produce such a resemblance as might be mistaken for it. In supporting large flowers, such as Dahlias, or shrubs, such as standard Roses, in the open garden, stakes of cast or wrought iron are frequently used, and the colour they are painted is almost always green; but though this colour abstractedly considered is so agreeable to the eye, yet its use on stakes to be used among living plants cannot be defended as artistical. A brown colour, or some tint nearer that of the bark of rods, say those of the ash or hazel, would undoubtedly be in better taste. Twining plants, such as the Convolvulus, are frequently encouraged to twine round cords made fast at the root of the plant at one end, and to a wall, horizontal rail, or some other fixed point or line, at the other. Very handsome screens may be formed in this manner, and also very agreeable figures, provided care is taken that the figure shall not be much broader at the summit than it is at the base. An obelisk, a column, a cone, a pyramid, or a cross, in an open airy situation, may be covered so as to produce a very striking effect. Arcades and covered ways, formed of framework of wood or wire, may be covered with creepers of every description ligneous or herbaceous; but the beauty of the flowers is only seen externally, and the advantage to the spectator walking beneath is shade alone. When shade and the beauty of the flowers are to be both enjoyed by the spectator in a covered walk, the covering ought to be produced by arches placed at regular distances, so as to admit of the air and light between, by which means the plants will be covered with flowers from the ground to the crown of the arch. The arches may either cross the walk at right angles, or they may cross each other so that the vertical profile of every two arches would form a cross.

Trees, after they have grown for some years, frequently lean to one side, especially such trees as the Judas tree, the Mulberry, the Pinaster, and even the Laburnum. These require props to set them upright, and the kind requisite for this purpose is a wooden prop forked at the extremity. *In like manner*, the branches of trees sometimes split, or for other reasons hang down, so as to incommode the path or the surface beneath; and in this case the branches require to be tied together by iron rods.

Pro'tea.—*Proteaceæ.*—Singular-looking plants, natives of the Cape of Good Hope, which are very difficult to cultivate, as their roots are fleshy and very apt to be injured either by a want of water or an excess. They must also have abundance of light and air, and not be crowded with other plants. They should be grown in pots nearly half-filled with potsherds, in light turfy loam mixed with equal parts of fine silver sand, and placed in a greenhouse. Great care must be taken in shifting them when they require larger pots, as their roots are very brittle, and will be found to have entwined themselves among the potsherds, from which it is very difficult to disengage them, and for this reason the drainage should not be disturbed, but transferred entire with the ball of earth to the new pot. These plants are propagated by cuttings taken off at a joint, and planted in separate pots in sand under a glass, but not plunged in a hotbed; and the glass should be frequently taken off and wiped, as the cuttings are very apt to damp off.

Protecting.--As half-hardy plants, trained against a wall, are frequently much injured by what are called perpendicular frosts, a thatched or wooden coping, projecting about two feet from the wall, will be found of the most essential service in protecting them. Such a coping, with a sprinkling of straw or dead leaves over the roots, and a hay-band twisted round the trunk of the tree, about a foot from the ground, to protect the collar of the plant, will be sufficient to protect even tender plants from all ordinary frosts. Standard plants may be protected by laying straw or dead leaves over the root, and covering them with a thatching of straw attached to the trunk of the tree, and sloping off widely at the base. Other coverings made of straw or rushes plaited and sewed together, or of osiers twisted like basket-work, may be used for smaller plants. One of these may be a kind of hurdle to protect plants against a wall; others may be used to put round the stems of young trees, and to cover tree peonies, and other tall shrubs, with an opening on the side next the sun to admit the air and prevent damp; and others are small beehive-like covers for protecting Geraniums or other greenhouse-plants in the borders.

PRUNE'LLA.—*Labiatæ.*—Herbaceous plants with showy flowers, natives of Europe and North America, which are well adapted for rockwork or geometrical flower-gardens. They should be grown in light rich soil; and they are increased by dividing the root.

PRUNING ornamental trees and shrubs is seldom practised to much extent; as all that is required is to cut out the dead wood and to prevent the shoots from growing out of shape. To do this effectually, every lady ought to be provided with a pair of pruning-shears, (see INSTRUMENTS) so contrived as to make what is called a draw-cut, and thus not to bruise the wood or the bark so as to prevent its uniting again smoothly. The cut should also be made slanting to a bud, so as as not to leave a piece of dead wood projecting beyond the young shoot, which has always a very bad effect. Much of the beauty of a flower-garden depends on removing the dead roses and other flowers as soon as they fade, and also all the dead or broken branches; but this is a point of culture which is very rarely properly attended to.

PRU'NUS.—*Rosaceæ.*—The Plum. Though the common Plum tree ranks among fruit-trees, and as such is not entitled to a place in the present work, yet there are many species of Prunus which may be considered as some of our most ornamental shrubs. Among these are ***P. cándicans***, with woolly leaves and long clusters of white flowers; ***P. cocomílla***, a native of Italy; ***P. marítima***, with white flowers and dark-blue fruit; and ***P. divaricàta***, with white flowers and yellow fruit. There are many other ornamental shrubs which are called Prunus in the nurseries, but which botanists now class in the genus CE'RASUS. Among these are the Mahaleb or Perfumed Cherry, formerly called ***Prùnus Mahàleb***; and the Bird Cherry, which Linnæus called ***Prù-nus Pàdus***. All the kinds of Prunus are quite hardy, and will grow in any common soil.

PSI'DIUM. — *Myrtaceæ.* — The Guava. Tropical shrubs which are generally grown in a stove in England, but one kind of which, Cattley's Guava, will ripen fruit in a greenhouse. In the West Indies the fruit is used for making the well-known Guava jelly. All the kinds should be grown in loam and peat, and they are all propagated by layers.

PSORA'LEA. — *Leguminosæ.* — Shrubby and herbaceous plants of easy culture, some of which require a greenhouse in England. They grow freely in loam and peat, and are propagated by seeds or cuttings. Most of the species are natives of the Cape of Good Hope.

PTE'LEA.—*Terebinthaceæ.*--American shrubs, quite hardy in British gardens, and ornamental for the fine yellow which their leaves take in autumn. They will grow in any garden soil, and they are multiplied by cuttings and layers.

PTE'RIS.—*Filices.*—Brake. A very ornamental kind of fern. For the culture, see POLYPO'DIUM.

PULMONA'RIA.—*Boragineæ.*--Herbaceous plants with rather ornamental flowers, natives of Europe and America, which will grow in almost any soil and situation.

PU'NICA.—*Granatáceæ* or *Myrtaceæ.*—The Pomegranate is a very handsome deciduous shrub or low tree, which, in the climate of London thrives against a conservative wall, and produces fruit which attain their full size, though they but seldom ripen. The fruit, which is of a globular shape and retains the calyx, has been admired for its form from the earliest ages, and is one of the most conspicuous ornaments directed to be used in the construction of Solomon's temple. There is a double-flowered variety, which, during the seventeenth and eighteenth centuries, was the most favourite plant in Continental and British orangeries next to the Orange and the Lemon; and there is also a dwarf double-flowered variety, which, when kept in a greenhouse, produces its fine vermilion flowers from August to November. The plant requires loamy soil and an airy situation; and care should be taken in pruning it not to cut out the small lateral twigs or spurs, on which alone the blossoms are produced, which should be left projecting from the wall. It strikes root freely from ripened cuttings and layers, and the yellow and the white-flowered varieties are sometimes grafted on the common kind.

PU'RSHIA.— *Rosaceæ.* — A little North American shrub with small yellow flowers, which is quite hardy, and should be grown in sandy peat. It is propagated by layers.

PYRE'THRUM. — *Compósitæ.* — Feverfew. Most of the species are hardy perennials, which only require planting in the open garden and the usual treatment of perennial plants. According to the latest arrangements of botanists, the Chinese Chrysanthemums are now included in the genus Pyrethrum.

PY'RUS.—*Rosàceæ.* — The Apple and Pear Trees. The different kinds of Crabs and Pears are very ornamental from their blossoms, independently of the utility of the fruit of some of the species. The ornamental kinds are all low trees, admirably adapted for the lawn or the shrubbery; they are all of easy culture in any common garden soil; and they are propagated by grafting the finer on the more common kinds. To thrive and look well, however, they require an airy situation, and not to be crowded among other trees. Most of the species, and especially the Crabs, are very liable to be attacked by insects in the leafing and flowering seasons; and they should then be carefully watched, and the caterpillars picked off as soon as they are visible. Among the kinds most worthy of notice are the following: ***Pỳrus spectábilis***, the Chinese Crab or Garland-flowering Wild Apple, producing the most showy flowers of the whole genus in May, and as hardy as the common Crab or Wild Pear. ***P. coronària***, the Sweet-scented Crab, with large and beautiful pink blossoms, highly fragrant, as is the first. ***P. c. angustifòlia***, the narrow-leaved Sweet-scented Crab, with blossoms as beautiful as the former, and with the leaves sub-evergreen. This, and the two preceding kinds, have the fruit green when ripe, and fragrant, but it is not good to eat. ***Pỳrus baccàta*** and ***P. prunifòlia***, the two kinds of Siberian Crab, have very showy blossoms, and small red or yellow fruit, useful in cookery. These are the principal ornamental species of the Crab or Apple kind, unless we except one, the Moscow or Transparent Crab, ***Pỳrus Astracánica***, which has fruit almost as large as a golden Pippin, wax-coloured, and almost transparent when ripe. Though commonly cultivated for its fruit, as useful for the table, it well deserves a place on the lawn as an ornamental plant, from the extraordinary beauty of the Crabs. The ornamental Pears are the following: ***P. salvifòlia***, which has woolly leaves like those of the Sage, and, like all the Pears, white flowers; this peculiarity, independently of other marks, distinguishing them from the Apples, which have always reddish flowers. ***P. amygdalæfórmis*** is another ornamental species, which has silvery-white leaves, and fruit shaped like that of the Almond; and to these may be added, ***P. eleagnifòlia***, which has long narrow white leaves like those of the Eleágnus; ***P. salicifòlia***, with long, narrow, silky leaves like those of the willow; and ***P. nivàlis***, which has round leaves of a snowy whiteness. All these species have small green fruit not good to eat; but the trees are most ornamental from their shape and the singular colour of their foliage. The following kinds of Pyrus belong to the section A'ria. ***P. A'ria***, and its varieties, ***P. A. angustifòlia*** and ***P. A. crética***, the White Beam Tree, are admired for the beauty of their leaves, which are green above and white beneath, and for the bright scarlet fruit which they produce in great abundance. ***P. vestìta***, the Nepal White Beam Tree, is a rare and beautiful object, as its leaves, which are clothed with a thick white wool beneath, are of a large size, and dye off in autumn of a most beautiful pale yellow. Other ornamental species of Pyrus are as follows: ***P. variolòsa***, remarkable for the varying forms of its foliage, which is sometimes pinnate, like that of the Mountain Ash, and sometimes deeply lobed and cut, like that of the Hawthorn, or entire and cordate and pointed, like that of the Pear. It is somewhat tender, and thrives best in a sheltered situation, or against a wall. ***P. torminàlis***, the Griping Wild Service Tree, is remarkable for the beautiful form of its leaves, which, however, are unfortunately very apt to be eaten by insects. The buds are large, of a beautiful green, and very ornamental in the winter season. ***Pỳrus aucupària***, the Mountain Ash, is a well-known small tree, beautiful both when in flower and in fruit, and worth cultivating for its foliage alone. ***Pỳrus americàna***, the American Mountain Ash, resembles the common sort, but has larger leaves and smaller fruit, though it is of a much deeper red. ***Pỳrus Sórbus***, the common Service Tree, has foliage like that of the Mountain Ash, but larger; and the fruit resembles that of the common Pear, but much smaller, and not ornamental though it is eatable. ***Pỳrus spùria***, a native of Kamschatka, has leaves like the elder, and small black fruit: the leaves of this species die off in autumn of an intensely deep purple, which is almost black. There is a pendulous variety, ***P. s. péndula***, which is one of the most ornamental of drooping-branched small trees; and, as neither the variety nor the species exceed twelve feet or fifteen feet in height, they are admirably adapted for small gardens.

The following kinds of Pyrus are shrubs, and very ornamental, both for their fruit and flowers: ***P. arbutifòlia***, has white flowers and black fruit, and the leaves of this become of a beautiful red in autumn, there are six or eight varieties, commonly treated as species; ***P. chamæméspilus***, which has large white flowers and red or black fruit, and ***P. floribúnda***, which grows about four feet high, and sends down weeping branches all round, which are covered with such a profusion of white flowers during the flowering season, that the plant looks like a hillock covered with snow. These last-mentioned shrubby kinds are sometimes called Aronia. All the plants belonging to the genus Pyrus are quite hardy, and will grow freely in any common garden soil, and they may all be raised from seeds, or grafted on the Wild Crab, or Wild Pear, or on the Hawthorn, which, though belonging to the genus Cratægus, is very nearly allied to Pyrus.

Q.

QUAKING-GRASS.—See BRIZA.

QUA'SSIA.—*Simarubiàceæ.*—Stove shrubs, natives of the East Indies, the bark, wood, and root of which are so intensely bitter, that an extract from the bark of some of the species is used as a substitute for hops in making beer, and also as a poison for flies. *Q. amàra* is very ornamental from its long upright racemes of bright scarlet flowers, the petals of which are curiously twisted together. The leaves also are very remarkable; they are impari-pinnate, with only two pairs of leaflets, the midribs of the leaflets, and also that of the main leaf, which is winged, being pink. The plants flower freely, if allowed plenty of heat. They should be grown in loam mixed with peat or sand; and they are propagated by cuttings.

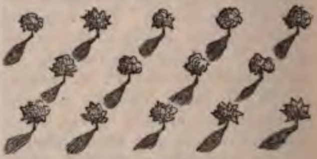
QUEEN'S NEEDLEWORK.—*Spiræa Salicifolia.*—See SPIRÆA.

QUE'RCUS.—*Amentàceæ,* or *Cupulíferæ.*—The Oak. The species are chiefly forest trees, but *Q. Ilex,* the evergreen Oak, and some of its varieties, may be treated as shrubs, and are very ornamental on lawns, and in pleasure-grounds. Some of the kinds of the Turkey Oak, *Q. Cérris,* are also very ornamental, particularly *Q. C. Lucombeàna,* which grows rapidly and forms a very handsome pyramidal tree. It ought however, to be purchased in pots, as it produces but few lateral roots, and seldom grows well, if it is transplanted from the open ground. The American Oaks are very handsome, particularly for the colours their leaves take in winter. *Q. coccínea,* and *Q. rùbra,* have deeply cut leaves, which become of a beautiful red in autumn; as do the leaves of *Q. palústris,* which are more elegantly shaped than those of any of the other kinds. Some of the dwarf American bear Oaks, such as *Q. Banísteri,* and *Q. ilicifòlia,* do not grow above two or three feet high; and they are called bear Oaks, because in their native countries the bears can eat their acorns, without climbing.

QUINCE.—See CYDONIA.

QUINCUNX.—A mode of planting trees in rows, by which the plants in one row are opposite the spaces in the next; so as to form a succession of diamonds. See *fig.* 27.

FIG. 27.



TREES IN QUINCUNX.

QUISQUA'LIS.—*Combretàceæ.*—A stove climber, a native of the East Indies, with singular flowers; and large and handsome leaves. The flowers are shaped something like those of the Jasmine, but with an excessively long tube, and a very small limb, which when it first expands is white, but which afterwards becomes pink, getting darker and darker, till it finally becomes of a blood-red. The plant should be grown in loam and peat, and it is propagated by cuttings struck in sand under a hand-glass.

R.

Ragged Robin.—See **Lychnis.**

Ragwort.—See **Othonna**; and **Senecio.**

Rake, a well known toothed implement for raking the surface of dry ground, or collecting together grass on lawns which have been mown, or weeds on surfaces which have been hoed. There is also what is called the Daisy rake, in which the teeth or tines are lance-shaped, sharp at the edges, and so close together that when drawn or raked over the surface of a lawn they collect or cut off the heads or flowers of such plants as the Daisy, Crowfoot, Plantain, &c. The heads of rakes, or that part which contains the teeth or tines, are of different lengths, from six inches to two feet; and the teeth, which are placed at from one inch to two inches apart, are from two inches to four in length. In raking dug soil with a view to render the surface even and fine, and also to collect stones, roots, &c. the handle of the rake should be held close to the middle of the operator, so that the tines may pass through the ground at an angle less than 45°; but when weeds or short grass are to be raked up, or the heads of Daisies to be cut off, the handle of the rake must be held above the middle of the operator, so that the tines may form an angle with the soil above 45°. In the latter case it is desirable that the tines should slide along the surface; but in the former it is necessary that they should penetrate into it throughout nearly their whole length.

Ranu'nculus.—*Ranunculàceæ.*—The Ranunculus. The species may be divided into two kinds: border flowers, and florists' flowers. The latter consist of some hundreds of varieties obtained from the species *Ranúnculus Asiáticus*, a native of the Levant with tuberous roots, which is rather too tender to endure the winter in the open air without some kind of protection. The wild plant grows naturally in Persia, in meadows which are moist during winter and in the growing season, but dry during great part of summer. Hence one of the first requisites in the culture of this flower is a loamy soil kept moist; and as the varieties are all double and in a highly artificial state, the soil requires to be made very rich with leaf-mould, or the mould of hot-bed dung. The common season for planting the Ranunculus is November; the roots may be placed about six inches apart every way, covered with two inches of soil, and protected by straw, mats, or rotten tan, during severe frosts. The plants will come into flower in July, and when the leaves wither, the roots may be taken up, dried in the shade, and preserved in a dry place till they are wanted for re-planting. A great many named kinds may be procured in the seed-shops, the most distinct of which are the Turban, or very dark red, the orange, the white, and the fine or cut-leaved. As the plant seeds freely even when semi-double, new sorts without end may be raised from seed, which may be sown in pots or flat pans as soon as it is gathered, and placed in a cold frame. Those persons who wish to grow the Ranunculus as a prize flower, should consult Hogg's Treatise on the Ranunculus, or some other work exclusively devoted to florists' flowers; but for private gardens, it may be sufficient to remark the following particulars. The tubers, if kept dry, will retain their vitality for two or three years; and hence, if roots which should be planted in November are kept out of the ground till the November following, and then planted and protected from frost, and when they appear above ground put into greenhouse.

heat, they will flower at Christmas. If not planted till December, they will flower about the end of January, and if not planted till January, they will flower in March. In this way, by always having a stock of old roots, and planting some every month in the year, Ranunculuses may be had in flower, all the year round. It is necessary, however, in the case of all those planted between March and November, to supply the beds abundantly with water, so as to keep the soil continually moist; and if they are not shaded during the mid-day sun, they will be very deficient both in size and colour. The common mode of propagating the Ranunculus is by separating the offsets from the larger roots.

The common Crowfoots are British weeds; but there are several border flowers belonging to this family which are well deserving of cultivation, and of which the following are the most remarkable: ***R. aconitifòlius***, the white-flowered Bachelor's Button, an old inhabitant of British gardens, prolific in double white flowers in May and June, and very ornamental; ***R. àcris flòre plèno***, the double-flowered yellow Bachelor's Button, which flowers in June and July, is also a very desirable plant; as are ***R. rèpens flòre plèno*** and ***R. bulbòsus flòre plèno***, both producing fine yellow double flowers in May and June. ***R. nemoròsus***, produces its yellow flowers from May to August; and ***R. pennsylvánicus*** is rare and curious. ***R. illýricus*** is remarkable for its silky white leaves, and ***R. monspeliàcus*** for its early flowers, which are produced in April. ***R. cortusæfòlius*** is handsome both for its foliage and flowers; and ***R. rutæfòlius*** is a low plant well adapted for pots or rock-work, producing abundance of pretty white flowers from May to July. ***R. platanifòlius*** is rare in British *rdens*, being commonly confounded with ***R. aconitifòlius***, from which it differs in growing to twice the height of that plant; and in producing its flowers in June and July, while the other flowers in May. ***R. plantagíneus*** is very handsome, with glaucous lanceolate leaves and white flowers produced in April; and ***R. angustifòlius***, ***R. amplexicaùlis***, ***R. parnassifòlius***, and ***R. gramíneus***, of which there is a double-flowered variety, are all very handsome and desirable species.

RAPHIO'LEPIS. — *Rosàceæ.* — The Indian Hawthorn. Very elegant shrubs, natives of China, with white flowers, the centre of which is red; the bark is also reddish; and there is a reddish tinge in the leaves. The species are only half-hardy in England, and they are generally kept in the greenhouse, though they will grow in the open air against a conservative wall. The soil in which they are grown should be a very sandy loam, or loam mixed with peat; and they are propagated by cuttings of the ripe wood struck in sand under a bell-glass.

REAMU'RIA.—*Ficoìdeæ.*— A very pretty little shrub, with fleshy leaves, and bright purple flowers, very suitable for rock work. It should be grown in peat and loam, or in heath mould, in rather a dry situation; as it is very liable to damp off if grown in a moist situation in the shade. It prefers a warm sunny bank, where it flowers abundantly, and is very ornamental.

RED CEDAR.—See JUNIPERUS.

RENANTHE'RA. — *Orchidàceæ.* — The Chinese Air-plant. A very handsome genus of the East Indian Orchideous Epiphytes. It is a true parasite, and never flowers well in a pot. It is a climbing plant; but it differs from all other climbers in attaching itself to surrounding objects by its long fleshy roots, which it twines round any post or column within its reach, as other plants do their tendrils. Though the most glowing accounts had been received of the splendour of the flowers of the Renanthera in China, it did not appear likely to realise these descriptions in England; and it was cultivated in this country for above ten years, before it formed a single spike of flowers. At last the ingenious expedient was devised of wrapping the long flexible roots round with moss, and keeping this moss constantly moist; and the result was, that the plant grew ten feet long, and produced several spikes, varying from two feet to three feet in length, of brilliant scarlet flowers. It is now generally grown on pieces of wood with the bark on, hung from the rafters near a column of the stove, or orchideous house, round which the long roots are suffered to entwine themselves, care being taken to wrap them in moist moss as they elongate themselves; and it is found that the plant flowers as freely as any other Orchideous Epiphyte grown in Britain.

Rese'da.—*Resedàceæ.*—There are many species of this genus, most of which are natives of the South of Europe and Egypt; but those best known in England are, ***Resèda luteòla,*** the dyer's-weed, which is a British plant; and ***R. odorata,*** for the culture of which see Mignionette.

Reserve-Ground.—In every garden accidents, diseases, and many other causes, occasion blanks or deformities in beds and borders, and the use of a reserve-ground is to contain a number of growing plants that at a moment's notice can be taken up and planted in the place of those which have ceased to be ornamental or desirable. Wherever there is a greenhouse it can hardly be kept in high order without a pit or frame in the reserve-ground for striking cuttings, and bringing forward plants to supply the place of those which are no longer ornamental in the greenhouse; and, particularly, for forcing bulbs and bringing forward annuals, such as Balsams, Schizanthus, &c., which are exceedingly ornamental when in flower, but without showy foliage at every other season. The reserve-ground, therefore, in point of extent, must bear some relation to the extent and the character of the garden which it is intended to supply. The smallest residence should have a few square yards of reserve-ground, including a pit, in an open airy situation, but concealed from the ornamental parts of the grounds; and residences of twenty or thirty acres in extent will require several pits, and the sixth or fourth part of an acre as reserve-ground. Where there is a walled kitchen-garden, the reserve-ground may very conveniently be placed adjoining the frame or forcing-ground, or form part of it; and in places so small as to have no kitchen-garden, a concealed glade, open to the south, with or without a small pit or frame, will still be necessary. The grand points respecting a reserve-ground which it is desirable to impress on an amateur gardener are, first, that a reserve-ground, including a pit, however small it may be, is essential to the keeping in high order of every plot of garden-ground, even those in front of street-houses, and of every garden of plants in pots, even those kept in window-sills and balconies; secondly, that the reserve-ground must be in an open airy situation, not shaded by trees; thirdly, that the herbaceous plants planted in the open ground in the reserve-garden must be taken up with balls of earth, and replanted twice or thrice a year, and the shrubs once a year; and fourthly, that where there is a choice of soil that of the reserve-ground should be of a loamy nature, such as will adhere to the roots of the plants, and never of sand, which will drop away from them. Where there is no reserve-garden there is no possible way by which even a street-garden, or the pots on a window-sill, can be kept always in the highest order, but by having recourse to the commercial gardener.

Rest-harrow.—See Ono'nis.

Rha'mnus.—*Rhamnàceæ.*—The Buck-thorn. Handsome deciduous and evergreen shrubs; some of which almost attain the size and appearance of small trees, and others are procumbent shrubs only fitted for rock-work. They are all however distinguished by a stiff upright manner of growth, and numerous strong thorns, from which they derive their name of Buckthorn. The flowers are generally small and not ornamental, but the berries are very much so; and the evergreen kinds are very valuable in shrubberies, from their hardiness and free habit of growth. The Alaternus (*Rhámnus Alatérnus*) is particularly valuable, because it bears coal smoke and the confined air of towns better than most other evergreens.

Rhámnus cathárticus, the Purging Blackthorn, is a deciduous shrub with large handsome leaves and showy berries. These berries when unripe are used for making a yellow dye, and they are sold for this purpose in the colour shops under the name of French berries; when ripe, their juice mixed with alum forms what is called sap-green; and if they are suffered to hang on the trees till autumn, their juice becomes purple. The Avignon berries, also used in dyeing yellow, are the fruit of *R. infectòrius*, which is a native of France, near Avignon. *R. saxátilis*, the Stone Buckthorn, which is a deciduous recumbent species, is a valuable plant for rockwork, or for clothing rocks or old walls, where it is desirable to give a wild and natural appearance to the scenery; and *R. erythróxylon*, the Red-wooded Buckthorn, is very ornamental as a tufted bush among rocks near water. *R. Frángula*, and *R. latifòlius*, are low trees. All the species are quite hardy, and will grow in any common garden-soil, and in any situation that is tolerably dry; and they are all easily propagated by seeds and layers.

Rhe'xia.—*Melastomàceæ.*—Herbaceous and shrubby plants, natives of America. *R. virgínica*, which is the handsomest species, is quite hardy in peat earth, in a moist situation, and it produces its showy pink, or rather rose-coloured flowers, with conspicuous yellow stamens, in July and August. The leaves are strongly ribbed as in all the Melastomaceæ, and slightly edged with pink. The shrubby species are more tender than the herbaceous ones, and they are generally kept in a greenhouse.

Rhi'psalis.—*Cácteæ.*—Very curious succulent plants, which are natives of both the East and West Indies. As the Opuntias may be said to be all leaves, and the different kinds of tree Cereus all stem, so the Rhipsalis may be considered all branches; for the whole plant consists of a series of short round articulated branches, spreading in all directions. The flowers of this genus differ from those of the Cacti generally, in being small and not very handsome. They are generally yellow. The species should all be grown in brick rubbish and sandy loam, and they should have very little water. The cuttings must be dried by laying them on a shelf for two or three days before they are planted.

Rhizo'phora.—*Rhizophòreæ.*—The Mangrove. These curious trees are natives of Madagascar and South Africa, where they are found growing on the sea-coast, and in marshy places on the banks of rivers. The seeds germinate in the capsule, and sending down roots become new plants while yet adhering to the parent branch. This singular property makes a grove of Mangroves have the appearance of a single tree; and we read of parties sent to explore the rivers of East Africa having found it impossible to penetrate through the Mangroves, with which the rivers are lined. In England the plant is a stove shrub, which it is extremely difficult to keep alive, on account of the warmth and moisture it requires; and which is not worth growing for either its flowers or fruit.

Rhoda'nthe. — *Compósitæ.* — A beautiful little annual plant, a native of the Swan River, whence its seeds were imported by Captain Mangles, who so well merits the gratitude of every lover of flowers for the numerous beautiful plants which he has been the means of introducing. The Rhodanthe is generally treated as a half-hardy annual, being sown on a hot-bed in February and planted out in May; but it may be grown to an enormous size by the following treatment. The seed must be sown the first week in April, in a soil composed of three parts of heath-mould and one of loam; and the young plants pricked out the first week in May into small thumb pots or sixties filled with a similar soil. In a week's time they should be shifted into pots a size larger; they should then be suffered to remain a fortnight, after which they should be again shifted into larger pots and the blossom-buds pinched off. This shifting may be repeated five or six times, always pinching off the blossom-buds, till the plant has attained a large size and shrubby character, which will generally be about the middle of August, and when it may be permitted to flower. A plant which had been treated in this manner, and which was given to me by Captain Mangles, measured a foot and a half high, and four feet in circumference; it had above a thousand blossoms on it expanded at one time; and it continued producing a succession of flowers from August to the middle of November.

Rhodi'ola.—*Crassulàceæ.*—Rose-root. There are only two species of this genus; one of which is a British plant, strongly resembling the House-leek, with a thick fleshy root, smelling so much like a Rose as to have given the name to the genus. The flowers are yellow and terminal. The plant is a perennial, and should be grown in a moist situation on rock-work.

Rhodochi'ton.—*Scrophularíneæ.* —*R. volùbile*, formerly called *Lophospérmum Rhodochìton*, is a Mexican climbing plant, with abundance of very handsome flowers. It was at first kept in the greenhouse, but it is now found to flourish most in the open air, as it will not flower well when its roots are confined. It should be planted in spring, in a pit about two feet square, formed in the open border, and filled with loamy soil, enriched with leaf-mould or rotten manure. As the plant grows, a little leaf-mould may be added from time to time over the roots; and the plant must be trained up a wire frame, or against a conservative wall. When it has done flowering, it should be cut down to within a few inches of the ground, and covered with tan or sawdust, and a pot turned over it, the hole in the pot being stopped up to exclude the rain; or what is better, the plant may be wrapped in moss and thus protected. The species is propagated by cuttings struck in spring or autumn, or by seeds sown on a hot-bed in February and planted out in May. When wanted for a balcony or greenhouse, it may be grown in a pot, all that need be attended to being to grow the plant in good soil, and to allow it plenty of room for its roots.

Rhododendron. — *Ericàceæ.* — The Rose Bay. Well-known evergreen shrubs, and low trees, with splendid flowers; which are generally grown in sandy peat, kept rather moist. Though one of the most common of the kinds, ***R. pónticum***, is a native of Asia Minor, and others are natives of other parts of Asia, and of Europe, the greater number of them being American, the part of the garden in which they are grown is generally called the American ground. The Rhododendrons vary very much in size, as well as in the colours of the flowers, some being trees and others trailing shrubs. The handsomest of the tree kinds is the Nepaul species, ***R. arbòreum***, which grows about twenty feet high, with immense bunches of dark scarlet or crimson flowers, which have the rich hue of velvet. These flowers secrete honey in such abundance, that when the tree is shaken the drops of liquid honey fall from it like rain. The leaves are large, and silvery beneath. There are several varieties, one of which has wax-like white flowers, and another cream-coloured flowers; others have the leaves rusty beneath. Most of the tree Rhododendrons are too tender to stand the winter in the open air; but a rose-coloured variety of ***R. arbòrea***, and that with snow-white flowers, are nearly hardy. Of the shrubby kinds, ***R. pónticum***, which is quite hardy, is the most common, and the one that has produced the greatest number of hybrids and varieties. Plants of this species are frequently trained with single stems four or five feet high before they are suffered to throw out side branches; and thus treated they form very handsome small trees. ***R. máximum***, in America, attains the height of twelve or fifteen feet, but in England it neither grows nor flowers freely. The leaves are of a pale yellowish green, and they generally look drooping, as though the plant wanted water. It is remarkable that it was grown twenty years in England before it produced a single flower. In its native country it is always found growing upon rocks near water; and it would probably thrive in a similar situation in this country. ***R. catawbiénse*** is a hardy American species, which flowers abundantly from June till August. It seldom grows above four feet high, but it forms a healthy-looking bush, perfectly covered over with flowers. The hybrids between this species and the Nepaul tree Rhododendron are very handsome. The principal dwarf species are, ***R. chrysánthum***, with yellow flowers, ***R. ferrugíneum***, and ***R. hirsùtum***, with rose-coloured flowers, and ***R. caucásicum***, with purple or white flowers. All these scarcely exceed a foot in height, and some of them are not more than six inches. ***R. daùricum*** flowers from December till March, and the flowers of the species appear before the leaves, though there is a variety that is evergreen. It is very ornamental, and it is valuable from the early season at which it flowers. All the Rhododendrons are what is called hair-rooted plants; and they are all grown in sandy peat, or in deep sandy loam. They may also be grown even in stiff clay, if it be kept moist; but the worst soil for Rhododendrons is that of a well-manured garden, particularly if the situation be a dry one; as this kind of soil has not tenacity enough to enable it to adhere to the fine hair-like roots of these plants. All the Rhododendrons may be propagated by cuttings of the young shoots, taken off while they are in a growing state—by layers, and by seeds. The latter is the most general mode, as the seeds, which are very small, and look like sawdust, are ripened in great abundance in the months of August and September; and the seeds of the American kinds are imported every year in large quantities from America. All the Rhododendrons and Azaleas may be removed at almost any season, and when of almost any size, if taken up with a ball of earth round the roots. The best seasons, however, for removing them are spring and autumn. It may be observed that Rhododendron seed will remain good for several years, though, when practicable, it is best to sow it as soon as it is ripe, as the plants will come up much sooner. All Rhododendrons should be grown in a shady, moist situation, and they will all thrive under the drip of trees.

RHODO'RA.—*Ericàceæ.*—*Rhodòra canadénsis*, is a very pretty little plant, a native of Canada, resembling the dwarf Rhododendrons, excepting that the flowers are much smaller, and the leaves are deciduous. It is quite hardy, and only requires to be grown in peat earth, kept moist. It flowers in April.

RHU'S.—*Terebinthàceæ*, or *Anacardiàceæ.* — Sumach. Deciduous shrubs, natives of Europe, Asia, and America, interesting from the beautiful colours which their leaves assume when dying off in autumn. All the kinds are more or less poisonous. *Rhus Cótinus*, the Virginian Sumach, is called the Periwig-tree both in French and German, from the curious appearance of its seed-vessels, which look like a powdered wig. It is a very ornamental shrub, often growing ten or twelve feet high, and flowering abundantly. It grows best in a dry loam, and it is propagated by layers. *Rhus typhìna*, the Stag's-horn Sumach, has received its name from the singular appearance of the young shoots, which are covered with a soft velvet-like down, resembling that of a young stag's horn, both in colour and texture. The leaves are imparipinnate, with eight or ten pairs of leaflets, and they die off of a beautiful purplish red in autumn. The flowers are produced in terminal spikes, and they are succeeded by deep purplish-red woolly fruit. *Rhus glàbra*, the scarlet Sumach, has red flowers, and rich velvet-looking dark-scarlet fruit, which becomes crimson as it ripens. *Rhus vernicífera*, the varnish or Japan Sumach, is a greenhouse plant in England, but in India, and in Japan, it is grown in large plantations, for its gum, which issues from the tree when wounded, and forms the finest varnish in the world. *Rhus venenàta*, the swamp Sumach, or poison-wood, has so virulent a sap that it occasions fever and inflammation in those who cut it down. Even touching the plant, or smelling it, will in many cases produce eruptions and swellings all over the body. The plant is not very handsome, but the leaves become of a brilliant red in autumn. *R. coriària*, the elm-leaved Sumach, and *R. copallìna*, the gum-copal tree, resemble *R. typhìna*; and *R. rádicans*, the poison-oak, and *R. toxicodéndron*, the poison-vine, are poisonous plants, natives of North America, resembling *R. venenàta.* All the kinds of Rhus are of easy culture in any loamy soil; and they may be all propagated by cuttings or layers. Several of the kinds may have their branches pegged down, and a little earth strewed over them, when they will strike root.

RIBBON GRASS.—*Arundo Donax*, var. *versicolor.*

RIBES.—*Grossulàceæ.*—The Currant. The ornamental kinds of Ribes which have been introduced into British gardens since the commencement of the present century, are now some of our most beautiful shrubs.

They are all quite hardy, and will grow without any trouble being taken with them, in any common garden-soil. The following kinds are those most deserving of cultivation for their flowers :—*Ribes níveum*, the snowy-flowered gooseberry, has white pendulous flowers, and dark purple fruit, the flavour of which is very agreeable; ***R. speciòsum***, the fuchsia flowered gooseberry, the flowers of which are scarlet, with very long projecting stamens, somewhat resembling those of the Fuchsia, and the leaves sub-evergreen; ***R. spicàtum***, the tree currant, which forms an erect fastigiate-growing shrub, six or eight feet high, with upright spikes of red fruit; ***R. multiflòrum***, a most beautiful plant, with long drooping racemes of greenish flowers, and large handsome leaves; ***R. punctàtum***, an evergreen species, with shining leaves and golden yellow flowers, which are succeeded by red fruit; ***R. flóridum***, the flowering black currant, with loose racemes of greenish-yellow flowers, and black fruit; ***R. cèreum***, the wax-leaved currant, the leaves of which are round, and appear thinly covered with white wax; ***R. sanguíneum***, the red-flowered black currant, a beautiful and well known species, of which there are several varieties; and ***R. aúreum***, the yellow-flowered black currant. All these kinds are very beautiful; but the most ornamental are ***Ribes sanguíneum***, and its varieties or allied species, ***R. glutinòsum***, with pale pink flowers, and ***R. malvàceum***, with lilac ones, and also the dark red variety ***R. s. atro-rubens***. There are also several kinds of ***R. aúreum***, all of which are well deserving of cultivation. All the kinds of Ribes are easily propagated by cuttings; or by seeds, which most of the kinds ripen in abundance—and one kind, ***Ribes punctàtum***, sends up suckers. They are generally quite hardy; but ***R. punctatum***, being a native of Chili, succeeds best against a wall. ***R. sanguineum***, and its allied species, are natives of California, and, like all the plants from that country, they are very liable to die off, if the collar of the root be exposed to the sun. Thus, a fine healthy plant of ***Ribes sanguíneum***, several feet high, and covered with flowers, will often wither and die away without any apparent cause; but if the facts connected with it be closely examined, it will generally be found that the ground in which the plant grows has become quite dry and powdery at the surface, so that the roots have been exposed to sufficient heat to wither them at the point of junction with the collar. This never occurs when the plant is suffered to remain in a state of nature, as it always sends out side-shoots near the ground, so as to shade its root; but in gardens and shrubberies these side-shoots are frequently trimmed away from a mistaken idea of neatness. In its native country, also, the ***Ribes sanguineum*** always grows partly in the shade, and near water. The colour of the flowers varies very much according to the soil in which the plant is grown; the darkest and brightest hues being observable in those plants which are grown in calcareous soils, and the palest and least brilliant in those grown in sandy soils. ***Ribes aureum***, the yellow-flowered currant, and its allied species and varieties, succeed best in gravelly soils, and appear in general very hardy.

RICE.—See ORYZA.

RICHARDIA.—*Aroideæ.*—Kunth's name for ***Cálla æthiòpica***. For the culture, &c., see ARUM.

RICINUS.—*Euphorbiaceæ.*—Palma Christi. The castor-oil plant, ***Ricìnus commùnis***, is a half-hardy annual in this country, worth growing for its splendid leaves and very curious flowers and seed-pods; but in the East Indies it becomes a tree. The oil is expressed from the seeds. When grown in England, the seeds should be sown in a slight hotbed in February, and the young plants removed to the open border in May. It should be grown in light rich soil, well manured with decayed leaves, and in a situation open to the sun.

Ricotia.—*Cruciferæ.*—A very pretty little annual nearly allied to *Lunaria*, which only requires sowing in the open border in April. See Annuals.

Ridging.—Throwing up ground in ridges, in order to expose it more thoroughly to the action of the weather. This operation is most useful in clayey soils, as the water freezing separates the particles of the clay, and lightens the soil; and it is performed by opening a trench, and throwing up the ground so as to form a kind of hillock sloping on both sides.

Robinia.—*Leguminosæ.*—Ornamental trees and shrubs, with long drooping racemes of flowers. The common kinds of Robinia are generally called Acacias in gardens; though why this name has been given to them, unless from their pinnate leaves, which resemble those of the true Acacia, it would be difficult to say. The name of Locust, which is applied to *Robinia Pseud-Acacia* in America, also appears to have no definite meaning, unless it alludes to the leaves, which bear a very slight resemblance to those of *Ceratònia Sìliqua*, the Locust Tree of Holy Writ. The flowers of all the kinds of Robinia are very handsome; but the arborescent species are not handsome trees, from the liability of their branches to be broken off by high winds, which gives them a ragged and untidy appearance; and the wood, notwithstanding the extravagant praises of Cobbett, is of very little value. The roots of the Robinia also extend just under the surface; and thus a tree of this genus occupies nearly twice the extent of ground which would be taken up by a tree of the same size of almost any other kind. The shrubby kinds of Robinia are also liable to the same objections; though the long racemes of rose-coloured flowers of the Rose Acacia (*R. hìspida*) are so beautiful, that no shrubbery should be without it. All the Robinias are quite hardy, and they may be grown in any soil, though they thrive most in a rather rich sandy loam; care should be taken always to plant them in a sheltered situation, as no plants are more injured by high winds. They are propagated by seeds, layers, cuttings, and suckers, which are produced in great abundance. When Robinias are raised from seed, the seeds should be steeped for twenty-four hours in hot water, before sowing; as unless this is done, they will sometimes remain in the soil two years before they germinate. When grown in strong clay, or in any moist soil, old trees of Robinia Pseud-Acacia are very often found, when cut down, to be hollow at the heart. Several plants formerly considered to belong to Robinia, are now distributed through the genera Caragana, Halimodendron, &c. Of these, the most beautiful are the Caraganas—see Siberian Pea Tree; and the Halimodendron, or Salt Tree.—See Halimodendron.

Rocket.—See Hesperis.

Rock cress.—See Arabis.

Rock rose.—See Cistus.

Rockwork is a very common ornament in gardens; and, producing a striking effect, it is introduced more frequently than judiciously. Rockwork may be divided into two kinds: that which is intended to imitate natural rocks, and that which is intended merely as a nidus for rock-plants. Imitations of nature should always consist of large blocks of stone of the same kind, and should for the most part be disposed in imitation of some kind of stratification. At the same time, as in many parts of the country, large, round, or roundish, or angular blocks of stone are found distributed over the surface, it is not objectionable to collect these together in groups so as to form a feature in scenery, and to insert plants among them. Rockwork as a mere nidus for plants should never be attempted on a large scale without the introduction of large blocks of stone, and some kind of stratification being adopted: and in this case, as before mentioned, using one kind of stone will produce an effect in accordance with that of nature. On a small scale, however, different kinds of stone may be used, more especially when these are well covered with plants; but even on a small scale, one kind of stone has always a better effect, and will be felt more agreeable to the eye, than a mixture of bricks, flints, pieces of granite, freestones, and perhaps marble, shells, fragments of carved stones, and even roots, which are not unfrequently seen in even the best gardens. Rockwork should always be an independent feature. It rarely looks well when piled up against a wall or around the roots of a tree, or in any situation where it is overshadowed by trees; in short, where it does not form the prominent feature in the scene. It looks well near water and merging into it, or in an open airy garden where it is surrounded by a gravel-walk; but it does not look so well when rising from turf, without an adjoining walk, or when large shrubs grow up among the stones. Where there are collections of such plants as Saxifrages or other alpines, or of *Cistuses*, Helianthemums, or other mountain shrubs, rockwork is very desirable; and in such cases, it may be placed on a lawn, as a feature in a general collection of herbaceous plants or shrubs arranged according to the natural system: but rockwork as an ornamental object, or as a nidus for a miscellaneous collection of plants, should always be in an open airy situation near a pond, or surrounded by a walk. In short, it may be laid down as a general principle that rockwork should either adjoin gravel or a piece of water, and should seldom or never adjoin trees or grass; or walls or buildings.

One of the most common faults in rockwork is the indiscriminate mixture together of all sorts of stones, bricks, shells, fragments of statuary or sculpture, and even roots of trees; which latter object, though very suitable as receptacles for plants, should always be arranged in masses apart from any intermixture of stones.—See ROOTWORK.

RODRIGUEZIA. — ***Orchidaceæ.*** — Orchideous Epiphytes, natives of tropical South America. ***R. secunda*** has beautiful pink flowers; but the other species have generally drooping racemes of greenish yellow flowers, more graceful than positively beautiful. All the kinds should be grown in moss, and they all succeed better on wood than in pots.—See ORCHIDEOUS EPIPHYTES.

ROE'LLA. — ***Campanulaceæ.*** — Cape plants, generally with blue flowers, which have somewhat of the dazzling glossy hue of Venus's Looking-glass. The shrubby kinds are of low growth, and rather difficult to propagate; but the annual species are of very easy culture, and only require the usual treatment of half-hardy annuals.—See ANNUALS.

RŒMERIA.—***Papaveraceæ.***— The purple Horned-Poppy. This is a very beautiful flower; but unfortunately, its beauty is so very short-lived that it is difficult to find a perfect flower, as one or two of its petals drop almost as soon as the flower expands. It is quite hardy, and only requires to have its seeds sown in the open border in April.

Rolling.—Gravel walks cannot be kept in proper order without frequent rolling; and this rolling is most efficacious when the ground is moist below, but the upper surface is dry. On this account the best time for rolling is a fine dry day, after two or three days' rains ; and when rolling is necessary in continued dry weather, the walk should be previously watered. Turf should also be rolled occasionally, to prevent its surface from becoming uneven.

Rondele'tia. — *Rubiaceæ.* — Beautiful stove plants, with white, pink, or scarlet flowers, natives of the East and West Indies. *R. odoràta,* which is the most common, has terminal corymbs of scarlet flowers greatly resembling those of *Ixòra coccinea.* It should be grown in a moist stove, in peat, sand, and loam, the pots being well drained with potsherds and cinders. The flowers are produced in great abundance, and they are very fragrant as well as beautiful.

Rootwork. — The roots of trees and especially large roots, including the stool, or base of the tree after the trunk has been cut down to the ground, may be combined together in various ways useful, ornamental, or curious, in gardening. Two or three large stools of trees grouped together on a lawn with mould and plants placed in their interstices, form a striking contrast to the smoothness and high art displayed on the general surface of the lawn. The plants placed among the roots, whether in pots concealed by mosses, stones, or mould, or planted in soil, should never be of indigenous kinds common in the locality; for these might be mistaken for weeds; but of exotic kinds, such as Geraniums, Petunias, Maurandyas, &c. or of British or European alpines of small size, neat foliage, and brilliant flowers. The idea to be kept in view is, that of creating artificial ornaments without much expense; and therefore, the roots must never appear to have been left where they are by carelessness or accident, but placed by design, and with reference to the composition of which they form a part. In many situations, conglomerations of roots as a receptacle for plants are more pleasing than conglomerations of stones; because they display less effort, and seem a more natural and easy way of obtaining a nidus for ornamental plants. Too much effort and expense for attaining any object is never altogether so satisfactory, as when the same object is obtained with ease and economy. Hence rustic seats in a pleasure-ground, and rustic vases, or other vessels for containing plants, are more satisfactory than cast-iron seats or marble vases, unless indeed the latter are connected with some building.

Roots may also be combined together so as to form seats, open or covered huts, grotto-like structures, and grotesque bridges; and one object for which they are particularly suitable is for placing on the margin of pieces of artificial water along with trees, bushes, or plants. A smooth expanse of water, like a smooth lawn, requires shade and roughness to contrast with it, in order to produce a striking effect; and roots at once supply both roughness and shade. In placing them, a part of the root should always be covered by the water, and another part by the soil; and by planting a young tree or bush adjoining the root, a double contrast is produced between the root, which gives the idea of an aged tree long since felled or dead, and the erect young shoot which foretells a future tree. The shadow of the group so formed in the water is a circumstance that redoubles the interest.

Roots may be piled up, and connected together by dowels or wooden pegs, so as to form arches, arcades, or covered ways, or grottoes, or other structures for shelter or repose; the interstices being filled in with moss or heath, and the exterior being thatched with heath, or the chips or shavings from hoops common in countries which abound in coppice-wood, such as Sussex. Roots also may be piled up so as to form grotesque fences, which are suitable for certain situations and purposes. A flower garden in a wood or sequestered glen, surrounded by a fence of this kind, has sometimes a striking effect; and sometimes the area of gravel before the entrance front of a villa is separated from the lawn by an irregular ridge of roots varied by greenhouse plants with the pots concealed.

A very common error in the use of roots, is that of mixing them with stones in rockwork, which has been already pointed out.—See ROCKWORK.

ROSA.—*Rosaceæ.*—The Rose-tree. Of all flowers none are more beautiful than roses; and none better reward the care of the cultivator. Roses are natives of Europe, Asia, Africa, and America, but none have yet been found in Australia. The number of roses is almost incredible, above a hundred distinct species have been described, and there are above two thousand named varieties to be procured in the nurseries. In this chaos, all that can be done in a work like the present is, to give a slight sketch of the different kinds of roses grown in British gardens, with a few particulars of the more remarkable species. The best known and most common kind of rose is the cabbage or Provence rose (***Ròsa centifòlia***). This species is a native of Eastern Caucasus, whence it was brought at a very early period. There are more than a hundred varieties of it; all very beautiful and very fragrant, and all distinguished by their close cabbage-like form, the curving inwards of their petals, and their slender footstalks, which give a peculiarly graceful and drooping appearance to the full-blown flowers. The moss roses are all varieties of the cabbage. All the cabbage roses may be grafted standard high on briars of the common dog rose; and they all require a richly manured soil, and an open situation. The French or Provins rose (***Rosa gallica***) is a compact erect-growing plant with large open flat flowers borne on stiff erect flower-stalks; thus forming as strong a contract as possible to the cabbage rose. This rose is found wild in France, and it is grown on a large scale near the little town of Provins in the department of the Seine et Marne, and also at Fontenay-aux-Roses near Paris, for the purpose of making conserve of roses. There are more than a hundred varieties of this rose. The French roses do not require a rich soil, and they are never grown as standards. ***Rosa damascèna*** or the perpetual rose differs from ***R. centifòlia***, in the large size of its prickles, the greenness of its bark, its elongated fruit, and its long reflexed sepals. There are above a hundred varieties of these roses, the most beautiful of which is Lee's perpetual or the rose du roi. These roses are very fragrant, and they continue blossoming till November. As the perpetual roses are of very luxuriant growth, and as they produce abundance of flowers, they should be grown in very rich soil, and their shoots not cut in. ***Rosa indica***, the Chinese or monthly rose, is the parent of another large family of roses, comprising upwards of two hundred varieties and hybrids; the most interesting of these are the tea-scented roses, and the Noisettes. The tea-scented roses are delicate little plants, with large drooping flowers, and they are supposed to be hybrids between the common and the yellow Chinese roses; they are rather tender, and should be grown against a south wall in a raised border composed of equal parts of vegetable mould, light loam, and sand. Many cultivators take them up in November, and keep the roots in a pot in a greenhouse, or laid in mould in a shed, till spring, when they may be planted out again into the open garden. The Noisettes are supposed to arise from a hybrid between the Chinese rose and the Musk rose, raised by M. Philip Noisette at Charleston in North America. This kind of rose is very hardy, and a most abundant flowerer, sixty or eighty flowers having been produced in one cluster; it is admirably adapted for standards and for rose pillars. There are nearly a hundred different kinds of Noisette roses.

The climbing Roses are of four different kinds; the Ayrshire, the evergreen, the cluster-flowered, and the Boursault. The Ayrshire climbing Roses, are all varieties of ***R. arvensis***, a trailing plant, which, when left on the ground in moist places, will throw out roots at every joint; but they are climbers by elongation, stretching themselves upwards through a mass of hedges and bushes, and covering them with flowers. The branches are in general slender and feeble; and where they have no support they are apt to become entangled with each other. All the Ayrshire Roses grow vigorously, sometimes making shoots twenty feet long in one season. The evergreen Rose (***R. sempervirens***) is a native of the south of Europe, greatly resembling the Ayrshire Rose in its flowers, but differing in its leaves, which are smooth, leathery, and evergreen. The evergreen Roses do not make such vigorous shoots as the Ayrshire Roses, and consequently are not so valuable as climbers, but they are much more so as undergrowth, for covering the ground in shrubberies, as they grow and flower freely under the drip of trees. When thus trained the shoots should be spread over the ground they are intended to cover, and pegged down near a joint, which will throw out roots, and the plant will thus grow vigorously. A sloping bank covered with these Roses in front of a breakfast-room window has a beautiful effect. They also look well grafted on low standards of the common dog Rose, as the shoots will descend all round and form a cone or pyramid of Roses. The many or cluster flowered Rose (***R. multiflòra***) is a beautiful plant, bearing large clusters of Roses; sometimes of more than fifty Roses in one cluster. More than three thousand Roses have been counted on a plant of this species at one time. The seven sisters' Rose (***R. m. Grevillei***) is a variety of this species. The Boursault Rose is generally considered by botanists to be another variety of ***R. multiflora***, but it differs from that species in several important particulars. It is a hard-wooded durable Rose, producing abundance of flowers, and growing freely; the shoots, which are of a purplish red, and almost without thorns, being often fifteen feet long in one season. The flowers appear very early, and are remarkable for their reticulated petals. All these Roses may be made to form beautiful objects on a lawn by training them up parasol-wires, which may be purchased at any ironmonger's, or up a pyramid. The latter may be made either of iron rods and wire, or of three pieces of wood, with holes bored in them at regular distances, through which narrow laths may be passed. It is useful to put a ball and spike on the top of this figure, to prevent birds from settling on it, which they would be very apt to do, and would dirty the flowers and foliage beneath. Climbing Roses may also be trained over trellis-work, or up the trunks of trees; in which last case they should be allowed to climb through the head of the tree, and to hang down from the branches in wild and graceful festoons.

Musk Roses (***Rosa moschàta***) form another family of Roses, though not a numerous one, as there are not above ten or twelve kinds; they have very long slender branches, which being too weak to support alone their large bunches of flowers, should be trained against a wall. These Roses never require pruning (except to cut out the dead wood), as the flowers are only produced at the extremity of the shoots. The Banksian Roses (***R. Banksiæ***), which are of two kinds, one with buff flowers and the other with white; the Macartney Roses (*R. bracteata* and *R. microphylla*) and some others, are natives of China, and rather tender in England, requiring to be trained against a wall, and to receive a little protection in severe winters. *R. Alpina*, the Alpine Rose, of which there are a great number of varieties; ***R. lutéscens***, the yellow American Rose; and ***R. spinosíssima***, the Scotch Rose, of which there are almost innumerable varieties, are hardy, early-flowering Roses, that will grow in almost any soil or situation. ***R. sulphurea***, the double yellow Rose, is, however, more difficult to manage. This beautiful rose, which till lately was only known in a double state, has large drooping flowers, shaped like those of the common Cabbage Rose, and is supposed to be a native of Persia. In some situations it grows freely, but in others the flower-buds burst on one side, when only half formed, and the flowers are thus imperfect. It should be grown in an open airy situation, in a light free soil, and it should have abundance of light and air. It should be well supplied with water during the flowering season, but the ground in which it grows should be so well drained as never to allow the water to remain in a stagnant state about the roots. When trained against a wall, it should have a north or eastern exposure rather than a southern one; and the shoots should never be cut in. This Rose, in fact, does not require any pruning, except what may be necessary to remove the dead wood; or to train the plant into shape, though the latter should be avoided as much as possible, as all wounds on this Rose are apt to produce canker. It is said to flower freely when grafted on the musk cluster at eight or ten feet from the ground, or on the common China Rose, but I have never seen the experiment tried. The most beautiful yellow Roses I ever saw were in the neighbourhood of Worcester, where the plant had grown in a border in front of a south-eastern wall, and had been partly trained against it, though for some time before I saw it, probably two or three years, it had evidently been left entirely to Nature. A plant supposed to be the single state of this Rose, was imported about 1835, by Sir Henry Willich, from Persia, and flowered for the first time in England in the garden of the London Horticultural Society, in the summer of 1840.

There are many other Roses not included in the foregoing enumeration;

the best known of which are the white Rose, ***Rosa alba***, with its numerous varieties ; the yellow Austrian Rose, ***R. lutea***, which has the petals scarlet above and yellow beneath ; the Sweet Briar or Eglantine, ***R. rubiginosa***, with its very numerous varieties ; the common Dog Rose or briar, ***R. canina***, which is common in the hedges in England, and its multitude of varieties ; the ever-flowering dark-crimson Chinese Rose, ***R. semperflorens*** ; and the Fairy Rose, ***R. Lawrenceana***. To these may be added the Isle of Bourbon Roses, ***R. Bourboniana***, the origin of which is uncertain, but which are generally supposed to be hybrids between the common China monthly Rose (***R. indica***) and the Rose à-quatre-saisons (***R. Damascena***). The Bourbon Roses are very beautiful ; they are large and rather flat, with rich velvet-like petals much darker inside the flower than on the outside. They flower in autumn, and they grow best in dry sandy soils, unless they are grafted standard high on the Dog Rose, when they should be manured like other standard Roses.

All Roses require a rich and free soil, and plenty of pure air. They are not so particular with respect to light, as they will flower beautifully in situations which are shaded, at least during part of the day ; and in fact, appear to prefer partial shade to constant exposure to the sun. Coal-smoke is very injurious to them. Roses are frequently planted in Rose-gardens or Rosariums, in which each kind of Rose is contrived to fill a separate bed, and these beds are arranged so as to form a regular figure like a geometric flower-garden. Pyramids or pillars of Roses are formed by twining the climbing kinds against framework ; or they may be trained over arcades, or so as to form baskets like that shown in ***Fig.*** 11, p. 104. The Rose is generally propagated by budding or grafting the finer kinds on the common briar, or by layers. New varieties are also raised from seed ; and the dwarf kinds are propagated by cuttings, most of the leaves of which should be left on, see ***Fig.*** 24, p. 231. Roses should be generally planted in autumn ; but some of the more tender Chinese and Musk Roses, may be planted in spring. A pit should be dug about two feet square every way, and half-filled with very rotten manure or vegetable-mould mixed with an equal portion of pit-sand ; or if the soil be naturally sandy, with equal parts of sand and loam. Every fifth or sixth year the Roses should be taken up, their roots shortened, and replanted in fresh soil, the old soil being removed ; and every year, in March, about half a barrowful of rotten manure should be laid on the surface of the ground, round the stem of the tree and spread out so as to cover the roots ; the unpleasant appearance of the manure being concealed by covering it with turf or stones. The pruning of Roses is a subject on which there are many different opinions, and Roses are generally cut in every year in October or March, so as not to leave more than three or four buds on each shoot. An opinion, however, appears to be gaining ground among gardeners, that this pruning has been carried too far, and that many kinds, particularly all the climbing Roses, ought not to be pruned at all. Roses are so easily forced, that, with a very little trouble, they may be had in flower every month in the year. For instance, some Moss Roses may be taken up as soon as they have done flowering, and having been put into pots and pruned, they may be kept in a shady situation in the open air till wanted for forcing. Those that are wanted to blossom at Christmas, should be plunged into a hot-bed, or put into a hothouse the 1st of October; those put into the hothouse in November will flower in January and February; and so on, always calculating that the plants will flower about two months after they are placed in the hothouse or frame. During the forcing they should be supplied abundantly with water of the same temperature as the house in which they are kept; and the heat they are kept in should never be less than 60° at night. The China Rose may be made to flower all the winter by keeping it in a greenhouse at 50°, and having pinched off all its flower-buds in summer and autumn.

The insects that attack Rose-trees are very numerous. Perhaps the most troublesome are the Aphides (see Aphis) which cover the tender shoots in summer and autumn. The caterpillars of several small moths are also very destructive to Rose-trees. One of these, which is called a leaf-miner, lives within the leaf, where it feeds upon the pulpy matter, leaving traces of its course by a number of pale yellow zig-zag lines, which are occasioned by the skin of the leaf withering when deprived of the pulpy matter which supported it. The perfect insect is called the red-headed moth (*Microsètia ruficapitélla*); and it is so small, that even with its wings expanded it does not measure more than a quarter of an inch. Another very destructive insect is the maggot or grub of one of the saw-flies. The perfect insect, which is a beautiful creature, with transparent wings, lays its eggs in the flower-bud; and in this the grub is hatched, eating its way out and destroying the petals that it passes through. Other insects are a kind of leaf-rollers, not exactly like those that infest the oak, but a species of the genus Lyda (belonging to the *Tenthredinidæ*), which construct a portable case in which they enfold themselves, of pieces of leaves, which they cut out and fasten together in a spiral direction. Besides, there is the rose-moth, a species of Tortrix, which fastens the bud, by a number of slender threads, to one of the leaves, which it doubles up like the folds of a fan.

The only sure remedies for all these insects are hand-picking and frequent syringing. Tobacco-water is also used; and this is made by pouring a gallon of boiling water on half a pound of the best shag tobacco, and letting the decoction remain till it is cold. The infected shoots should then be dipped in the tobacco-water, and suffered to remain in it about a minute, and then washed with clean water. If the tobacco-water be suffered to dry on the plants, it will blacken the young shoots; and the remedy will thus be worse than the disease. Lime-water is also sometimes used, but no more lime should be put into the water than to make it look slightly milky; and the leaves should be washed after it has been suffered to remain on a short time. Dipping the shoots in clean water, and laying them on in one hand, while a soft brush is gently passed over them with the other, is also found efficacious.

Roscoea. — *Scitamineæ.* — Handsome stove-plants, somewhat resembling the Indian shot. They should be grown in loam, peat, and sand; and they are increased by dividing the root.

Rose.—See Rosa.

Rose Acacia.—*Robínia híspida.* —A very handsome shrub with pinnate leaves, and long drooping racemes of rose-coloured flowers. It will grow in any soil, but it should be placed in a sheltered situation, on account of the brittleness of its branches, and their liability to be broken off by high winds. See Robinia.

Rose Bay.—See Rhododendron and Oleander.

Rose Campion.—*Agrostémma.*—The very pretty flowers known by this name are now included in the genus Lychnis. Many of the kinds are annuals; but the common Rose Campion, *A. coronària*, is a perennial.

Rosemary.—See Rosmarinus.—

Rose of Heaven.—*Agrostémma* or *Lýchnis Cœli Rosa*, an ornamental annual from the Levant, quite hardy in British gardens.

Rose of Jericho. — *Anastática hierochuntìna.*--A cruciferous annual from the Levant, of no beauty, but curious from the manner in which its branches curl round the seeds when they are ripe. The end of the shoot containing the seeds thus protected, falls off, and is blown by the wind from place to place without discharging the seeds, so long as it is dry; but as soon as the ball reaches a moist place, where the seeds can germinate, the protecting branches relax, and the seed drops out.

Rose-root.—See Rhodiola.

Rosmarinus. — *Labiatæ.* — The Rosemary, *R. officinalis*, is a well-known shrub, which will thrive in any sheltered situation, but which is liable to be injured by frost in severe winters. It will grow in any common garden-soil; and it is propagated by cuttings, planted in spring.

Rotation of Crops.—It has been found by a series of experiments that the same kind of annual plant should never be grown for more than two years in succession in the same ground, without manuring or renewing the soil; as plants either throw out a quantity of excrementitious matter which they will not reimbibe, or exhaust the soil of all those properties which are nourishing for them. The ground, however, which thus becomes unfit for one kind of plant is found to be suitable for another kind quite different; and the making these plants succeed each other in a proper manner is called the rotation of crops. Perennial plants, and trees and shrubs, are not so liable to injury from their poisoning the soil, as they elongate their roots every year, so as to have their spongioles always in fresh soil; but some shrubs, such as Roses, which never have long roots, should either be transplanted every third or fourth year, or have manure laid on the surface of the soil, to supply them with fresh food.

Rotheap is a heap composed of sand, and such fruit as haws, holly-berries, ashkeys, hornbeam-nuts, and similar seed-vessels, which is turned over several times in the course of the winter, to promote the decomposition of the exterior covering of the seed. The object is to save room in the nursery, because these seeds, and others, if sown before the flesh or exterior covering is rotted off, will lie dormant in the soil for a year; whereas by rotting it off and sowing the seeds in the spring of the second year after which they are gathered, they come up the following May or June. The rotheap is kept in what is called the rotting-ground, which may be in any open situation fully exposed to the weather. The heaps may be one or two feet in thickness, and of any convenient width, the object being to produce decay without inducing such an active fermentation as would generate sufficient heat to destroy the vital principle in the seeds.

Rubbish—such as broken bricks, stones, remains of old walls, &c.—is of great use for laying at the bottom of a flower-bed or border in an open garden in which bulbs are to be grown. A similar bed has also been found very useful for growing Dahlias, as they are very liable to be injured by stagnant moisture.

Rubia.—*Rubiaceæ.*—The Madder. The perennial species, which are not remarkable for their beauty, are quite hardy, and will grow in any soil. There are also some half-hardy shrubs, which are worth cultivating in a greenhouse for their flowers, which are generally yellow. A red dye is derived from the roots of all the species, but principally from those of *R. tinctòrium*, which is cultivated as a field-plant in the south of Europe.

Rubus.—*Rosaceæ.*—The Bramble. There are but few ornamental species of this very extensive genus. *R. odoratus*, the flowering Raspberry, with reddish flowers, and *R. Nootkànus*, the Nootka Sound Bramble, with large white flowers, both kinds being sweet-scented, are the most ornamental. To these may be added the double-flowered common Bramble (*R. fruticòsus* var. *pompònius*) and *R. spectabilis*, the Californian Bramble, with fragrant dark purple flowers, and dark yellow fruit. All the brambles are very hardy, but very short-lived; their stems dying down every second year, like those of the common Raspberry (*Rubus idæus*). They all send up numerous suckers, by which they are propagated; and they all delight in a moist soil and shaded situation; though they will not thrive exactly under the drip of trees.

Rudbeckia.—*Compositæ.* — Very showy perennial, biennial, and annual plants, which should be grown in light rich soil. They attain a very large size, and are therefore only suitable to large gardens. They are all hardy and of the easiest culture of their respective kinds.

Rue.—See Ruta.

Ruellia.—*Acanthaceæ.*—Herbaceous plants with pretty tube-shaped blue flowers. Some of the species require a stove, and others a greenhouse; but they should all be grown in light rich soil, and are propagated by cuttings.

Ru'mex. — *Polygoneæ.* — The Dock. Most of the species are British weeds, but some few are grown for their flowers. They like a very deep and rich soil.

Ruscus. — *Smilacineæ.* — The Butcher's Broom. Very curious evergreen shrubs, most of which bear their flowers and fruit on their leaves. All the species prefer shady situations under the drip of trees, where but few other plants will grow; and they are all readily increased by suckers from their roots, which they throw up in abundance. One of the kinds is sometimes called the Alexandrian Laurel.

Russelia. — *Scrophularineæ.* — *R. juncea* is a very elegant stove-plant, with slender rush-like branches, and scarlet tube-like flowers. It should be grown in light rich soil, and abundantly supplied with water while in a growing state. It is propagated by cuttings, struck in heat.

Ru'ta. — *Rutaceæ.* — The Rue. *R. graveolens* is a well-known glaucous leaved plant, having a very unpleasant smell, and a bitter taste. The leaves are nearly blue, and from their peculiar colour sometimes produce a good effect in a shrubbery. The flowers are yellowish. The plant will grow in any soil or situation.

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Sa'bal.—*Palmæ.*—The Palmetto, or American Palm. These palm-trees, which are natives of tropical America, require a stove in England, and they should be grown in light loamy soil. They are increased by suckers, which they send up freely. They are all of dwarf stature, and grow freely in a somewhat moist heat.

Sa'ccharum.— *Gramineæ.* — The Sugar-cane grows freely in England, if kept in a stove in a very rich loamy soil. It may be increased by suckers; or if a part of the stem be laid in a trench in the tan-pit, or in rich loam, where it has bottom-heat, it will form plants at every joint.

Saccola'brium.— *Orchidaceæ.*— East Indian Orchideous Epiphytes, which should be grown on wood, but which are not very handsome, unless very closely examined. For their culture, see Orchideous Epiphytes.

Sacred Bean of India.—See Nelumbium.

Saffron.—*Crocus sativa.* — See Crocus.

Sage.—See Salvia.

Sagitta'ria.—*Alismaceæ.* —Water plants, some of which require a stove, others a greenhouse, and others are quite hardy. They should all be grown in loamy soil, with their stems in water; and they are increased by seeds or dividing the roots.

Sago Palm.—See Sagus.

Sagus. — *Palmeæ.*—A kind of palm, from the pith of the stem of which Sago is made. The plants should be grown in sandy loam, and they should be exposed to a strong moist heat. The seeds are produced in a sort of cone, which is of a brilliant shining brown, and very handsome; but the plant has never yet produced seeds in this country.

Saint Agnes's Flower. — The Snow Flake.—See Leucojum.

Saint Barnaby's Thistle.—*Centaurèa solstitiàlis.*

Saintfoin.—See Onobry'chis.

Saint John's Bread.—See Cerato'nia.

Saint John's Wort.—See Hype'ricum.

Saint Martin's Flower.—*Alstrœmèria Flos Martìni.*—See Alstrœmeria.

Saint Peter's Wort.—The Snow Berry.—See Sympho'ria.

Salica'ria.—See Ly'thrum.

Salico'rnia.— *Chenopodiaceæ.*— Glasswort. Succulent British plants, which grow naturally by the sea-shore. When cultivated, they should be grown in silver-sand, and a little salt laid occasionally on the surface of the soil, so as to be washed in by watering or rain. One of the kinds is sometimes eaten as a culinary vegetable, under the name of Marsh Samphire.

Salisbu'ria. — *Amentaceæ*, or *Taxaceæ.* — This very remarkable plant was originally called *Ginkgo bilòba*, Ginkgo being its name in Japan. Its name has, however, now been altered to the more euphonious one of *Salisbùria adiantifòlia*, the leaves resembling in form that of the Maiden-hair Fern, the botanic name of which is ***Adiantum.*** As the Salisburia grows to a very large size, and as there are specimens in the neighbourhood of London above sixty feet high, it would not have been mentioned here, had it not been very ornamental when young. The tree has flowered at Kew and at other places; but it has never borne fruit in England, though it has in France.

Salix.—*Amentaceæ* or *Salicaceæ.* —The Willow. A very extensive genus of ligneous plants, varying in size from the tree Willow, of seventy or eighty feet high, to the creeping half-herbaceous kinds called *S. herbàcea*, *S. vaccinifòlia*, &c. Of these *S. herbacea* creeps so close to the ground that it forms on the Swiss mountains a kind of turf, not rising more than an inch above the surface of the ground, and yet forming, when closely examined, a complete miniature tree. All the kinds of Willow grow best in moist soil, or near water; and they all grow in such situations very rapidly. The Weeping Willow (*Salix Babylonica*) has been known to grow twenty feet high in ten years, and the other species to increase in a similar proportion. All the common Weeping Willows grown in England are female plants; and it is supposed that the kind imported from St. Helena, and called Napoleon's Weeping Willow, is the male plant. Of the tall shrubby kinds of Willow, *Salix capræa*, the great round-leaved Sallow, or Grey Withy, is, perhaps the handsomest; and it is the flowering branches of this species that are called Palms in the neighbourhood of London, and are gathered by children on Easter Sunday. The Willow will grow in any soil which is not too dry; and it is propagated by cuttings, which strike root when merely put into the ground, without any other trouble being taken with them.

Sallow.—A kind of Willow, with roundish shaggy leaves.

Salpiglo'ssis. — *Solanaceæ* or *Scrophularineæ*. — Very beautiful half-hardy annual plants, natives of Chili. The seeds should be sown in February on a slight hotbed; and the young plants should be planted out in May. The soil should be loam mixed with one-third of peat or sand; and the situation should be sheltered, and partially shaded; as, if the collar of the plant should be exposed to the burning heat of the sun, so as to become withered, the plant will die off suddenly. It is also very easily killed by the collar being exposed to stagnant moisture. When grown in pots, it should be frequently shifted, always into pots only a little larger than the previous ones, so as to make the plant bushy. It varies very much according to the soil and situation in which it is grown; and if kept through the winter in a greenhouse, it will become partially woody, like the mignionette. There are many different kinds, which are made species by some botanists, but which are now generally allowed to be only varieties. Many gardeners sow the seeds in autumn, and keep the plants in frames all the winter, that they may flower early in spring.

Salsola.—*Chenopodaceæ*.—Saltwort. Annual and biennial succulent plants which grow wild on the sea-coast in Britain, and which are sometimes cultivated for their curiously-shaped round stems. Soda is made from one of the species.

Salt-tree.—See Halimodendron.

Salt-wort.—See Salsola.

Salvia. — *Labiatæ*. — The Sage. No one who has only seen the common Sage growing in a kitchen-garden could imagine the splendidly flowering plants which belong to the genus Salvia. Some of these, as for example *S. formòsa*, are shrubby and have dark scarlet flowers; and others, such as *S. pàtens*, have their flowers of the richest blue; others, such as *S. aurea*, have golden yellow flowers; others, such as *S. dentàta*, have white flowers; and in others, such as *S. involucrata*, and *S. purpùrea*, the flowers are purple. Besides these, some of the kinds have violet flowers, and others pink or crimson; and the different kinds of Clæry (*S. horminum*) are not cultivated for their flowers at all, but merely because the points of the shoots are so deeply tinted as to have the appearance of flowers. The plants differ in their habits as much as in their flowers; some are shrubby, some perennial, some biennial, and some annual; and some are so tender as to require a stove; while others must be kept in a frame or greenhouse, and the greater part are quite hardy in the open air. All the kinds should be grown in a light rich soil; and they are propagated by cuttings, division of the root, or seeds, which last nearly all the species ripen in great abundance. There are above a hundred and fifty distinct species of Salvia, besides varieties.

Sambac. — The Indian Jasmine. See **Jasminum.**

Sambucus.—*Caprifoliaceæ.*—The Elder. The common Elder, ***Sambucus nigra***, is a low tree, seldom, if ever exceeding twenty feet in height, and generally having the character of a shrub rather than that of a tree. The species is not ornamental, but there is a variety with cut leaves, ***S. n. laciniata***, which is very much so. The most ornamental kind of Elder is, however, ***S. racemosa***, with loose panicles of large dark scarlet berries, which look like bunches of bright scarlet grapes. All the different kinds of Elder thrive most in rich soil kept moist, and they are propagated by layers, cuttings, and seeds, which ripen freely. They are all quite hardy, and require very little attention from the gardener.

Samphire. — ***Crithmum maritimum.***—A British rock plant which grows on the sea-coast, and is used as a pickle.

Samyda. — ***Samydeæ.*** — Pretty stove shrubs with very curiously-shaped flowers, natives of the West Indies. They should be grown in loam and peat, but they are rather difficult to cultivate.

Sand is an important article in the propagation and culture of plants; and no good garden, whether small or large, ought to be without a stock of it. Sand relatively to gardening is of two kinds: pure white silver sand free from earthy matter and ferrugineous particles, which is only found in particular situations; and common brown or grey sand which is found in pits either with or without gravel, and on the shores of rivers or the sea. The first kind of sand is used for striking heaths, and other plants difficult to root by cuttings, and also for mixing with peat for growing the more tender kinds of house plants. This sand is procured in abundance in the neighbourhood of London and Paris from pits; but throughout the country in general, it is chiefly to be found mixed with peat, and forming what is called heath soil on the surface of heaths or commons. In these situations this sand, from being exposed alternately to the air, the sun, and the action of rain, becomes white by bleaching, and is indispensable to the gardener; but when it exists in heath soil in a sufficient proportion for growing plants, pure sand is only wanted by the gardener for striking cuttings. It is, however, so useful for this purpose, that a quantity of it ought to be procured, and carefully kept in a box where it will not be mixed with other soil, by every person who grows plants in pots.

Common coarse sand is used for striking the commoner kinds of plants either by cuttings or layers; it is also used for placing under bulbs when planting them, and in general for mixing with soil of different kinds with a view to render it more free and pervious to water. This description of sand may be procured in almost every part of the country; and it is only necessary to guard against pit-sand which is of a rusty brown, and consequently strongly impregnated with iron, and sea sand which is necessarily impregnated with salt. By mixing irony sand with quicklime in a state of powder, the iron may be neutralized; but this operation requires a year or two to effect it, besides the expense of the lime, and the necessity of separating it afterwards by sifting. Saline sand may be rendered fit for use by repeated washings with fresh water; but this expense can only be advisable, when no other sand can be procured. In various parts of the country there is a lead coloured soft sandstone, which when broken, and reduced to a state of powder, forms an excellent sand, both for mixing with soil, and striking cuttings.

Sandal-wood.—See Santalum.

Sanguina'ria. — *Papaveraceæ.*— Puccoon, or Canadian Bloodwort. A very pretty little plant with white ranunculus-shaped flowers. It should be grown in a light sandy soil, and it has a very good effect as filling one of the beds of a geometric flower-garden. The plants are increased by seed or division of the root.

Sanguiso'rba.—*Rosaceæ.*— Great Burnet. Some of the exotic kinds are ornamental; they are hardy herbaceous plants, and should be grown in light rich soil. They are increased by dividing the root.

Santalum.—*Santalaceæ.* — Sandal-wood. Stove plants, natives of the East Indies, and one species from New Holland. The flowers of *S. album*, the true Sandal-wood, are small, and are produced in spikes or racemes; but the great value of the plant consists in the fragrance of the wood, which is so great that the wood is burned for incense, &c. and is said to be destructive to all noxious insects. The plants should be grown in light sandy loam, and kept rather dry; but the wood has comparatively very little fragrance in this country.

Santolina.—*Compositæ.*—Lavender cotton. Evergreen dwarf shrubs, which will grow in any common garden soil, and which are propagated by cuttings.

Sanvita'lia. — *Compositæ.* — A beautiful little Mexican annual, well adapted from its dwarf stature and compact habit of growth for covering a bed in a geometric flower garden. The flowers are large in proportion to the size of the plant, and they are of a rich brown and yellow. It is quite hardy, and only requires sowing in March or April in the open border.

Sapindus. — *Sapindaceæ.* — The Soap berry. Natives of the East and West Indies, which require a stove in England. They should be grown in loam and peat, and they are propagated by cuttings.

Sapo'naria.—*Silenaceæ* or *Caryophyllaceæ.*—Soapwort. Very beautiful little plants, annual and perennial, greatly resembling some of the kinds of Lychnis. All the kinds of Saponaria look very well on rockwork, covering it with a profusion of beautitiful little pink flowers. The handsomest kinds are *S. ocymöides*, and *S. calábrica* for the perennials; and *S. vaccària*, and *S. perfoliàta* for the annuals. They will all grow in any common garden soil.

Sa'racha.—*Solanaceæ.*— Annual and perennial plants, natives of Mexico and Peru. *S. viscòsa*, which is the handsomest species, has rather large cream-coloured flowers beautifully marked in the centre with olive dots, and which are succeeded by large red berries. It may be treated as a half hardy annual; or the roots, which are tuberous, may be taken up, and kept dry during winter like those of the Marvel of Peru, and other similar plants. When treated as an annual, the seeds should be sown on a slight hotbed in February, and the young plants removed into the open border in May.

Sarca'nthus. — *Orchidaceæ.* — East Indian Epiphytes, nearly allied to Vanda, which should be grown on logs of wood.—See Orchideous Epiphytes.

Sarracenia.— *Sarraceneaceæ.*— The American Pitcher plant, or Side-saddle flower. Bog plants with very curious flowers, and pitcher-shaped leaves. Though natives of Canada, where they flower freely, and are produced in great abundance, they are seldom flowered in England without the aid of artificial heat. They are grown in pots filled with peat and moss, and placed in saucers of water, or in the open air, on the banks of ponds or rivers. When kept in a room, or on a balcony, they should be grown in double pots, the interstice between the two being filled with moss.

Sarsapari'lla.—See Smilex.

Sasanqua.— A kind of Camellia, the blossom of which strongly resembles that of the tea-tree.

Sassafras.—*Lœurus Sassafras.* —A large tree, a native of North America.

Saty'rium.—*Orchidaceæ.*— Terrestrial orchidaceous plants from the Cape of Good Hope. The leaves are very curious from the flat manner in which they spread themselves on the surface of the pot; and the flowers which are generally yellow, are very handsome. They should be grown in very sandy loam or peat; and they are generally kept in a greenhouse. They are very apt to damp off if over-watered.

Saw-fly. — Beautiful flies with clear wings, which are furnished with a curious instrument like a saw in the lower part of the body, with which they wound the bark to deposit their eggs. These eggs, like those of some other insects, greatly increase in size after they are laid. The grub or maggot is short and thick, with a black shining head, and when attacked it can let itself down with a thread. These insects are very destructive to Rose trees, as they destroy the flower-buds.

Saxifra'ga.—*Saxifragæ.*—Well-known herbaceous plants, many of which are natives of Britain, with white, yellow, or pink flowers. They are all of the easiest culture, and will grow in any light garden soil, though they prefer a deep sand. *S. umbrosa* is the London Pride, and *S. granulata*, the common mountain Saxifrage. All the kinds are handsome, and many of them are well adapted for rockwork.

Saxifrage.—See Saxifraga.

Scabio'sa.—*Dipsaceæ.*—The Scabious. Ornamental perennial, and annual plants, mostly natives of Europe and the East Indies, that will grow freely in any common garden soil, and may be increased by seeds.

Scabious.—See Scabio'sa.

Schi'nus.—*Anacardiaceæ*, or *Terebinthaceæ.*—Deciduous shrubs or low trees, natives of Brazil and Peru, nearly allied to Duvaua. The flowers of *Schinus Mulli*, the commonest species, are small and of a yellowish green; but they are succeeded by berries of a beautiful rose colour and highly polished. The leaves are impari-pinnate and very handsome, and they have the same peculiarity as those of the Duvaua. (See Duvaua) *S. Mulli* was first considered a stove plant; it was afterwards transferred to the greenhouse, and it is now found to succeed in the open air. It was introduced in 1597, but it was very scarce till about 1830, when it was first tried in the open ground. It will grow in any common garden soil; and it only requires a slight protection during hard frosts.

SCHIZA'NDRA. — *Menispermaceæ.* —A climbing or trailing half-hardy shrub, with scarlet flowers, nearly allied to *Cocculus indicus.* For the culture see COCCULUS.

SCHIZANTHUS.--*Solanaceæ* or *Scrophularineæ.*—A genus of very beautiful half-hardy annual flowers, which may be either sown in autumn or spring. If wanted to flower in spring, the seed should be sown in August or September as soon as it is ripe, in light rich mould; and the young plants should be kept in well-drained pots in a frame or greenhouse during winter. In February they should be shifted into larger pots, and this shifting should be repeated every week or fortnight till the plants have formed their flower-buds. Care must be taken in shifting the plants not to injure the roots, as they are very tender and succulent. The plants are also liable to die suddenly if the collar is exposed to much sun-heat, or much moisture. The soil should be composed of equal parts of vegetable mould and sandy loam, or of loam, peat, and rotten manure from an old hotbed. When the seeds are sown in spring it should be on a hotbed, and the young plants should be removed into the open air in May, when they will flower in autumn. The plants are much larger in the open ground, and the flowers are finer, if the soil be sufficiently rich and light; but care should be taken to plant them in a sheltered situation, or to tie them to stakes, as the stems are very brittle and very liable to be broken off by high winds. The principal kinds of Schizanthus are *S. pinnàtus*, with its varieties, all of which have purplish flowers; *S. retusus*, with scarlet and yellow flowers; and *S. Priestii*, with white and yellow flowers. Of these, *S. pinnàtus* and its allied species or variety, *S. porrigens*, are the hardiest.

SCHIZOPE'TALON. — *Cruciferæ.* — An annual flower, with curiously cut petals, and a strong tap root. It is rather difficult to grow, as it does not bear transplanting well, unless when quite young, and it requires a deep free soil for its descending root. It should be sown in spring, and if possible, where it is to remain.

SCHOTIA. — *Leguminosæ.* — Cape shrubs with very showy flowers, which may be kept in a greenhouse during the greater part of the year; but which should be removed to a stove or hotbed frame during winter. They should not, however, be plunged, as bottom-heat does not appear to suit them. They should be grown in peat mixed with a little loam, or in very sandy loam, the pots being very well drained; and they are propagated by cuttings struck without bottom-heat. Many gardeners keep them in a greenhouse all the year, covering them with a hand-glass and a mat in very severe weather.

SCHUBERTIA. — *Coniferæ.* — See DECIDUOUS CYPRESS.

SCILLA.--*Asphodeleæ.*--The Squill or Wild Hyacinth. Bulbous-rooted plants, mostly natives of Europe, which send up their beautiful bell-shaped flowers before their leaves. Their flowers resemble those of the Hyacinth, but they are much smaller. *S. siberica* is perhaps, the most brilliant blue flower grown in British gardens; and there are other kinds with white or pale pink flowers, well deserving of cultivation. *S. nonscripta*, the Wild Hyacinth, is sometimes called the Blue Bell, and the Hare Bell; but these names are also applied, and apparently with more propriety, to *Campanula rotundifolia.* See CAMPANULA. All the kinds of Scilla are quite hardy, but they thrive best in a sandy soil and a somewhat shady situation. They are increased by offsets, and the bulbs may be taken up in autumn if it is thought necessary to remove these; but otherwise they may remain in the ground several years without sustaining any injury.

Scitamineæ. — Hot-house plants with reed-like stems, long broad leaves and showy flowers, which are usually fragrant.

Scorpion grass.—See Myosotis.

Scorpion Senna. — *Coronilla emenes.*—See Coronilla.

Scorpi'urus. — *Leguminosæ.* — Caterpillars. Annuals with yellow pea-flowers, the seed-vessels of which resemble caterpillars. The species are all natives of the south of Europe, and they are all quite hardy in British gardens.

Scorzone'ra. — *Compositæ.* — Viper's Grass. Handsome perennials, with purple, pink, or yellow flowers, quite hardy in British gardens and growing in any common garden soil.

Scotch Laburnum.—*Cýtisus alpinus.*—See Cytisus.

Scottia. — *Leguminosæ.* — An Australian shrub with reddish pea flowers, quite hardy in British gardens, if grown in sandy peat.

Screens differ from sieves in having the wires in parallel lines, and not reticulated; and in being too large to be shaken by the hands. A screen consists of a number of parallel wires fixed in a wooden frame, and supported at one end by two wooden posts, while the other rests against the ground; and the earth to be sifted is thrown by spadefuls against the wires, so that while the mould passes through them, the stones and rubbish fall on the side next the gardener. The earth must be well broken with the spade before it is thrown upon the screen, and the operation can only be performed when the weather is dry.

Scrophularia.—*Scrophularineæ.*—Figwort. Perennial plants with brownish flowers, mostly natives of Europe, and growing in any common garden soil.

Scutellaria.—*Labiatæ.*—Skull-cap. Handsome perennial plants, generally with blue flowers, but the flowers of some of which are sometimes pink, yellow, white, or purple; all being shaped like those of the snap-dragon. Some of the species are natives of Britain and other parts of Europe, and others of North America and Australia. They all grow best in peat or in very sandy loam; and they are all quite hardy in British gardens.

Sea Buckthorn. — *Hippóphae rhamnöides.*—See Hippophae.

Sea Heath.—See Frankenia.

Sea Holly.—*Erýngium Aquifòlium.*— An umbelliferous perennial with blue flowers, a native of Spain, which should be grown in very sandy loam.

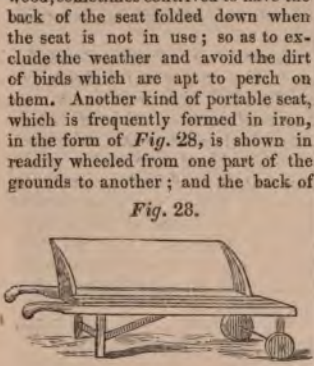
Sea Lavender.—See Statice'.

Sea Ragwort.—*Cinerária maritima.* — A half-hardy dwarf shrub with yellow flowers, a native of the south of Europe, which is generally grown in a greenhouse, in a mixture of loam and peat.

Sea-side Balsam.—*Croton Eleuteria.*—A native of Jamaica.—See Croton.

Seats for gardens are either open or covered; the latter being in the form of root-houses, huts, pavilions, temples, grottos, &c., and the former being either fixed, temporary, or portable. Fixed seats are commonly of stone, either plain stone benches without backs, or stone supports to wooden benches. Sometimes also, wooden seats are fixed, as when they are placed round a tree, or when boards are nailed to posts, or when seats are formed in imitation of mushrooms, as in the grounds at Redleaf. Fixed seats are also sometimes formed of turf. Portable seats are formed of wood, sometimes contrived to have the back of the seat folded down when the seat is not in use; so as to exclude the weather and avoid the dirt of birds which are apt to perch on them. Another kind of portable seat, which is frequently formed in iron, in the form of *Fig.* 28, is shown in readily wheeled from one part of the grounds to another; and the back of which also folds down to protect the seat from the weather. There is a kind of camp stool which serves as a portable seat, imported from Norway, and sold at the low price of 2*s*. 6*d*. or 3*s*.; and there are also straw seats like half beehives, which are, however, only used in garden-huts or in any situations under cover, because in the open air they would be liable to be soaked with rain. There are a great variety of rustic seats formed of roots and crooked branches of trees, used both for the open garden and under cover, and there are also seats of cast and wrought iron of great variety of form. There should always be some kind of analogy between the seat and the scene of which it forms a part; and for this reason rustic seats should be confined to rustic scenery; and the seats for a lawn or highly-kept pleasure-ground, ought to be of comparatively simple and architectural forms, and either of wood or stone, those of wood being frequently painted of a stone-colour and sprinkled over with silver sand before the paint is dry, to give them the appearance of stone. Iron seats, generally speaking, are not sufficiently massive for effect; and the metal conveys the idea of cold in winter and heat in summer.

Fig. 28.



MOVEABLE GARDEN SEAT.

When seats are placed along a walk, a gravelled recess ought to be formed to receive them; and there ought, generally, to be a foot-board to keep the feet from the moist ground, whether the seat is on gravel or on a lawn. In a garden where there are several seats, some ought to be in positions exposed to the sun, and others placed in the shade, and none ought to be put down in a situation where the back of the seat is seen by a person approaching it before the front. Indeed the backs of all fixed seats ought to be concealed by shrubs, or by some other means, unless they are circular seats placed round a tree. Seats ought not to be put down where there will be any temptation to the persons sitting on them to strain their eyes to the right or left, nor where the boundary of the garden forms a conspicuous object in the view. In general, all seats should of a stone colour, as harmonizing best with vegetation. Nothing can be more unartistical than seats painted of a pea-green, and placed among the green of living plants.

Securida'ce.—*Polygaleæ.*—Stove climbers from the West Indies, with white flowers, which should be grown in a mixture of peat and loam.

Securi'gera.—*Leguminosæ.*—The Hatchet Vetch. A hardy annual, with yellow pea-flowers. It requires no other care than sowing in March or April, but as it is very coarse-growing, and requires a great deal of room, it is not suitable for a small garden. This plant was called *Coronílla Securidàca* by Linnæus.

Se'dum. — *Crassalaceæ.* — The Stone Crop. Succulent plants with white, red, or yellow flowers. The genus takes its botanic name of *Sedum* from the Latin verb *Sedere* to sit, because in its wild state it appears to be sitting or crouching on the old walls or rocks which form its habitat; and its English name of Stone Crop alludes to the same habit of growth, as it appears to be growing out of stones which afford no other crop. All the species, though quite hardy, should be grown in well-drained pots filled with turfy loam, mixed with lime-rubbish; and they are all admirably adapted for rock-work. They are increased by cuttings, or dividing the roots.

Seeds.—The gathering and preservation of seeds is an occupation peculiarly agreeable to persons fond of gardening; partly, no doubt, because it contains so much of future promise, and on the same principle that sowing is universally considered a more exciting operation than reaping. The greater number of seeds of ornamental herbaceous plants are contained in long narrow pods called siliques, or sillicles, such as those of the cruciferous plants; or in leguminous pods, such as those of the Sweet Pea; or of capsules, such as those of Campanula; but a number of plants produce their seeds naked in tubes, such as the Scrophularinæ; on receptacles such as the Composita; and some in fruits more or less fleshy, such as the Fuchsia. All seeds may be known to be ripe, or nearly so, by the firmness of their texture, and by their changing from a white or greenish colour, to a colour more or less brown. There are, indeed, some seeds which are whitish when ripe, such as the White Lupine, and of several of the sweet peas; and other seeds that are quite black, such as those of some Ranunculuses, but in general a brown colour is a characteristic of ripeness. Seeds should be gathered on a dry day after the sun has had sufficient time to exhale all the moisture which dews or rains may have left on the seed-vessels. In general, the pods, or capsules, should be cut off with a small portion of the stalks attached, and the whole should be spread out, each kind by itself, on papers in an airy room or shed, from which rain, and the direct influence of the sun, are both excluded. When the seed-vessels are thoroughly dried, they may be put up in papers without separating the seeds from them; and kept in a dry place, rather airy than close, till wanted for sowing. Seeds preserved in the seed-vessel no doubt make comparatively clumsy packages, to seeds from which every description of husk or covering has been separated; but in this clumsy state they are found to keep better than when cleaned. Nevertheless, when they are to be sown the following year, or sent anywhere in a letter, it is better to take them out of the covering, and render them as clean as possible, by passing them through sieves, with holes sufficiently large to admit the escape of dust, but not of the seeds. Such sieves on a small scale every lady may make for herself by turning up the edges of a piece of thin pasteboard cut in a circular form, and piercing the bottom with holes with a large pin or darning-needle. When it is determined to separate the seeds from the seed-vessels, instead of putting up the whole together, the vessels after gathering may be dried in the sun; when many of the seeds will come out by the expansion of the seed-vessels in the heat, and the remainder can easily be rubbed out. This is the usual practice of nurserymen. For keeping seeds a lady ought to have a small cabinet, which she might form herself of pasteboard, with as many drawers as there are letters in the alphabet; and as her seeds are put up in papers, she can tie the packets of each genus by themselves, and put them in the appropriate drawer. Where so much trouble cannot be taken, a large brown paper bag, or a canvas bag, for each letter of the alphabet, may be substituted.

The period during which seeds will retain their vegetative powers differs in different families, genera, and even species. Seeds of the Ranunculaceæ and the Cruciferæ, will, in general, retain their vitality for several years, in whatever manner they may be kept; provided the situation be not such as will cause them to germinate. On the other hand, seeds of the Capsicum will keep for several years if retained in the berry, but will seldom grow the second year when removed from it. As a safe general guide, it may be adopted as a rule, that all seeds will keep three years, and grow, provided they are retained in the unopened seed-vessel; that most seeds, if maturely ripened, and kept in a dry place in close paper packets, will grow the second year; and that all seeds whatever, whether kept in the seed-vessel or exposed in open drawers like those of the seedsmen, will grow the first year after being gathered. Mignionette seed will keep seven years; but that of stocks and wall-flowers will not remain good more than two years, unless kept in the pod. Sweet peas and lupines will, with difficulty, keep two years, while the seeds of Prince's feather and of poppies will keep several years. Larkspur seed will seldom grow after the second or third year. Notwithstanding the length of time which some seeds will keep, it is generally advisable to sow them as soon after they are ripe as practicable, as fresh seeds always vegetate much sooner than old ones.

Selfheal.—See **Prune'lla.**

Sempervi'vum. — *Crassulaceæ.*— House Leek. Succulent plants, the most beautiful of which are natives of the Canary Islands, and require to be kept in the greenhouse. They should be grown in sandy loam, mixed with lime rubbish, and the pots should be well drained. They require very little water, except when about to flower; and they are propagated by cuttings, which must be laid to dry for some days before they are planted. When potted they should neither have any water, nor be covered with a glass; but they may be plunged into a bed of tan or dead leaves. The hardy kinds are very suitable for rock-work, and are increased by suckers from the roots.

Sene'cio. — *Compositæ.*—A very extensive genus, including many plants which are quite worthless, such as the common British weed called Groundsel (*S. vulgaris*); many showy garden flowers, such as the Jacobæa, or purple ragwort (*S. elegans*); and even some hothouse and greenhouse shrubs. Of these one of the handsomest garden-flowers is the double purple Jacobeæ, which is a native of the Cape of Good Hope. It differs from the common British ragwort (*S. Jacobeæ*), the flowers of which are yellow, not only in its flowers but in its habit of growth. The seeds of the purple Jacobeæ should be sown on a slight hotbed, and the young plants removed to the open borders in May; if kept during the winter in a greenhouse they will become shrubby like the Mignionette. All the species of Senecio like a rather rich loamy soil, kept open by a mixture of sand or peat, and most of them are hardy. There are, however, a few Cape shrubs belonging to the genus, which require a greenhouse. According to the new arrangement of the Compositæ by Professor De Candolle, nearly the whole of the genus Cineraria has been incorporated in that of Senecio. See Cineraria.

Sensitive Plant.—See Mimosa.

Shaddock.—See Citrus.

Shading is necessary to plants after transplanting, to prevent the evaporation from the leaves, which takes place when the plants are exposed to the full heat of the sun, being greater than the roots can supply moisture to support. Besides this, partial shade is necessary to many plants which cannot bear the direct rays of the sun; such, for example, as the Californian annuals—plants which in their native state grow in thick woods, fens, &c. In these cases, however, it is not necessary that the shade should be so great as for newly-transplanted plants. There is a great deal of difference in plants, with regard to their flowers bearing the direct rays of the sun. Some require solar influence to make them expand, such as all the kinds of Mesembryanthemum; while others, such as the Evening Primrose, only unfold their flowers when the sun withdraws its rays. Most of the orchideous epiphytes, which grow in dense woods, succeed best in hot-houses glased with green glass, which affords them the requisite degree of shade.

Sharp Cedar.—*Acacia Oxycedrus.*—See Acacia.

Sheep Laurel.—See Kalmia.

Sheep's Scabious.—See Jasione.

Shepherdia.—*Elæagneæ.*—Beautiful shrubs, or low trees, with silvery leaves, which were formerly considered to belong to the genus Hippophea. The silvery appearance of the leaves is produced by their outer surface being of a bluish green, and their lower surface lined with a soft silky down of snowy whiteness. The plants are natives of North America, and may be grown in peat, or in very sandy loam.

Sherardia. — *Rubiaceæ.* — Field Madder. Very pretty British weeds, which may be introduced with good effect on rockwork.

Shifting is the operation of transferring plants grown in small pots to other pots a little larger: and it is of very great advantage when it is wished to keep plants short and bushy. In shifting, the ball of earth round the roots is not broken, but placed in the centre of the new pot, and the earth filled in round it.—See Potting.

Shingle Oak.—*Quercus imbricata.*

Shrubby Trefoil.—*Ptèlea triefoliata.*—See Pte`lea.

Shrubby Cinquefoil.—*Potentílla fruticosa.*—See Pote'ntilla.

Shrubbery.—A walk bordered by shrubs and trees with some flowers in front, is called a shrubbery. In small villas it generally leads from the house to the kitchen garden; and sometimes goes round the latter, or is conducted round an open lawn. The object in forming a shrubbery is to produce as great an extent of interesting walk as the nature, extent, and other circumstances of the place will admit. There is then no positive rule for either the length of shrubbery walk or its direction; and unless a given situation were to be treated of, only some general directions can be given, or principles laid down respecting the planting of the shrubs and trees.

If we examine most of the shrubberies in country residences, we shall find that there is a general sameness in the appearance of the trees and shrubs with which they are planted, from one end of the shrubbery to the other. This sameness results from the mode commonly employed of mixing those kinds of trees and shrubs that can be most readily procured indiscriminately together. Some evergreens are distributed throughout the whole, such as a few Hollies, and a few Pines and Firs; laurels, and with a few roses, and perhaps a few honeysuckles. The rest is made up of the common mixture planted by contractors or jobbing gardeners on such occasions. The object is merely to produce a plantation which shall have some flowering shrubs in it, and some herbaceous plants and roses. If we examine the progress of such a plantation from the time it has been planted till it has attained the age of twenty or thirty years, we shall find that at the end of four or five years the herbaceous plants will become choked up, and are either killed or rendered unsightly. In six years the roses will have ceased to flower freely for want of light and air, and of manuring the soil; and hence they will have become the very reverse of ornamental. In ten years the finer shrubs will have been choked up by the coarser kinds, and in twenty years almost all the shrubs will have vanished, having been destroyed by the trees. There is no way of preventing this result to a shrubbery planted in the usual manner, except by constant thinning; beginning in the third year, and removing all the herbaceous plants that have not sufficient room and air and light to grow and flower freely. The bulbs may be left as long as they will grow; because as they have but little foliage, and that foliage is produced early and soon dies off, they are under no circumstances so disagreeable in their appearance as dicotyledonous plants. The roses should be removed whenever they cease to flower vigorously; and all the other shrubs should be thinned out when their branches begin to interfere with one another. Where the shrubbery is twenty or thirty feet wide, every shrub should be kept separate from every other shrub, so as to be clothed with branches from the ground upwards; or the shrubs should be encouraged to grow in groups of different sizes, each group being kept more or less distinct from every other group. It may be thought that this mode of keeping the single plants and the groups distinct, will prevent the shrubbery from serving as a screen; but this is a mistake; because though the plants, by being placed alternately, will admit the eye of the spectator on the walk to see in among them, which in passing along a walk adds greatly to the variety of its effect, yet this very circumstance, will prevent the eye from passing the boundary. Any person may prove this by drawing circles representing the shrubs or groups on paper to a scale; and supposing the strip of plantation to be thirty feet in width; and the circles some of them to be five feet in diameter, and some of them ten feet. The style of planting and thinning so as to keep each plant distinct, and always about to touch but never actually touching those around it, is what Mr. Loudon calls the gardenesque treatment of shrubberies and plantations; and the style of grouping is called the picturesque mode of planting and management. These remarks may be considered as directions for making the most of a shrubbery already planted in the common manner; and in so far as thinning is concerned, they will equally apply to the mode of planting which is now about to be described.

Planting shrubberies so as to produce variety in the aspect of the plantation is to be effected by one mode only, and that is to cause one kind of tree or shrub always to prevail in one place. In extensive shrubberies this will require several plants of the same species or variety to be placed together; but this occasions no additional expense; because in a common shrubbery at least, the same number of plants of one species would be planted, the only difference being that they would be placed in different parts of the plantation. In a small shrubbery perhaps not more than one or two plants of a species or variety might be required; more especially if the object was to include as extensive a collection in the shrubbery, as could conveniently be procured. There are almost a thousand trees and shrubs, exclusive of roses, in British nurseries, which may be purchased at moderate prices; and all these may be used in a shrubbery which contains no more ground than a single acre. Supposing that only one plant of a kind is planted, and supposing that each genus or natural order is kept by itself, every part of the surface of the plantation will be different from that which precedes or follows it; and the greatest variety which the case admits of will be produced. So many plants planted on one acre, will, however, soon cover the soil; and therefore in three years after planting, it will be necessary to begin to thin them. The thinning in this case ought to be directed to the removal of the commoner and coarser kinds. The most complete shrubbery that can be imagined is one which should contain all the larger trees distributed along it as a background, with all the smaller trees in front; next to these should be the larger shrubs, then the smaller shrubs, next the roses, and finally in the front, apart from the roses, should be the herbaceous plants; thus forming a splendid bank of vegetation on level ground. To prevent such an arrangement from becoming monotonous, it is essentially necessary that it should be combined with the natural system of relationship between the kinds; and this ought to be carried out in the roses, and in the herbaceous plants, no less than in the shrubs and trees. To solve this problem so as to carry the idea into execution, is one of the nicest points for an amateur landscape gardener to attempt.

All shrubberies whatever, however scientifically they may be planted and thinned out afterwards, will ultimately become old, and entirely lose the character which they had during the first eight or ten years after planting. Hence, in small places, which have been planted a certain number of years, it is impossible to have a shrubbery such as is here described, without removing the large trees and shrubs already existing; and this must necessarily depend on the taste of the proprietor, and whether a collection of young trees and shrubs, which have a bare and new look, but which will be continually increasing in beauty and magnitude, be preferred to a few full-grown plants which are already in a state of perfection, and which have an air of grandeur and repose.

When a shrubbery is planted, and for some years afterwards, the ground should be kept clear of weeds by hoeing or slight digging; and the shrubbery should be separated from the walk by a verge of turf or of box. When the opposite side of the walk is turf, such as a lawn, then the side next the shrubs must have a verge of turf also; but where a walk passes through the middle of a shrubbery, box edgings may be used on both sides. In general, however, a grass verge is greatly to be preferred, as being more appropriate to a scene connected with the lawn; and as not calling up ideas of a kitchen garden, or of a small flower-garden, where the beds are usually edged with box. Whatever may be the width of the gravel walk, the grass verge should not be narrower than two feet, because less than that width cannot always be kept in good order; such as neatly mown, level, and with the margins clipped but not pared. Besides a narrow verge has an appearance of meanness, and gives the idea of want of space. As the shrubs spread over the ground, there will soon be scarcely any part of the interior of the shrubbery, that will not be covered by their lower branches; and the shrubs along the margin will extend their branches towards the verge and even spread over it. When this is the case, which generally happens in four or five years, all digging and hoeing becomes unnecessary; and the turf verge ought to be encouraged to extend in width under the branches of the plants, the roses and herbaceous plants, if any have been planted, being removed. This is a point in the management of shrubberies which is almost everywhere defective; for the gardener generally continues cutting the inner edge of the verge and digging the ground among the herbaceous plants and the roses, till he has reduced the verge to about six or eight inches in width next the walk; this being the only part on which he will suffer any grass to grow; while the roses and herbaceous plants which have long ceased to be either healthy or ornamental are left to display their stunted and naked branches, with the dug earth for a back ground. The constant digging and stirring of the ground breaks off the branches of the shrubs, and thus an unsightly gap is created, which entirely destroys all the pleasing ideas excited by glades of smooth turf, appearing here and there to penetrate among the trees. To produce this latter effect, as the branches of any of the shrubs begin to spread over the verge, all digging and paring ought to be left off, and the grass encouraged to extend itself nto the bays and recesses of the lantation. In like manner, in a shrubbery with the walks edged with box, the box ought to be removed whenever the branches begin to spread over it, leaving no edging to the walk at all except what is formed by the retiring and advancing of the branches of the shrubs. This will form a walk with what is called picturesque edgings; but if a definite or a gardenesque edging is required, it may be formed of brick or stone. On no account whatever ought any kind of vegetable edging to be kept up which does not grow freely; for it is a maxim in gardening which ought never to be forgotten, that what cannot be grown well, ought not to be grown at all.

SIBERIAN CRAB.—***Pyrus baccàta***, and ***P. prunifolia.*** These trees, though frequently grown in kitchen gardens and orchards for their fruit, deserve admission into ornamental plantations for the beauty of their crabs when ripe.

SIBERIAN PEA TREE.—***Caragàna Altagana***, and ***C. arboréscens.***—The genus Caragana consists of a great number of low trees and shrubs, with abruptly pinnate leaves, and pea-flowers, which are generally yellow. They are mostly natives of Siberia, and flower early in spring; their light elegant foliage often appearing as early as March. All the species are very ornamental; but the tree kinds are more so than the others. ***C. jubàta,*** which differs from the rest in having white flowers tinged with red, is a low shrub, not above eighteen inches high, presenting a curious shaggy appearance from the footstalks of the leaves remaining on, and becoming hard and thorny, after the leaflets have dropped off. ***C. Chamlaga***, the Chinese Caragana, which is naturally a low shrub, forms a very graceful pendulous tree, when grafted on a stock of ***C. arborescens*** ten or twelve feet high. All the

Caraganas were formerly considered to belong to the genus Robinia. They are all quite hardy, and will grow in any common garden soil; most of the species prefer a poor gravel, but *C. arborescens* thrives best in the neighbourhood of water. The species are propagated by layers or cuttings, or by seeds, which they ripen in abundance.

Sida.—*Malvaceæ.*—Stove, greenhouse, and hardy plants, natives of the East and West Indies, and North America, with showy white, pink, or yellow flowers, which they produce in great abundance. They are grown in loam and peat, and generally ripen seeds; by which, and by cuttings, they are readily increased.

Sideroxylon.—*Sapoteæ.*—Iron-wood. Half-hardy and hardy shrubs, and low trees, natives of America, the East Indies, and the Cape of Good Hope. Some of the species have been removed to Bumelia, and one species, a native of Morocco, which is hardy in British gardens, is now called Argania. All the kinds should be grown in loam and peat; and they have all small white, or whitish-green flowers.

Side-saddle Flower.—See Sarracenia.

Sieves are necessary in gardening to separate the stones and coarser particles from the mould to be used for potting, and also for cleaning seeds. Garden sieves for mould should be made with deep wooden rims, but for seeds the wooden rim may be more shallow: in both cases the wires, or *toile métallique*, through which the mould is to pass, should be firmly attached to the rim, the holes or interstices not being more than the fourth of an inch in diameter.

Sifting is the operation of passing any kind of soil through a sieve or screen to deprive it of its coarser particles. Decayed leaves and rotten dung are also sifted; as it is only the fine mould that falls from them that is useful in vegetation. Sifting, however, should be used with caution; as some plants thrive better when the particles of soil are not too fine. Turfy loam, for example, should generally be chopped small with a spade or trowel, and not sifted; and peat should not be deprived of the vegetable fibre in which it abounds. Sifted earth when of a loamy nature, is very apt to cake together and to become impenetrable to the finer roots of plants.

Sile'ne'.—*Silenaceæ* or *Caryophyllaceæ.*—The Catchfly. Well known annual and perennial plants, many of which are natives of Britain, with flowers something like those of the pink. They are nearly all quite hardy, and only require the common treatment of their respective kinds. Lobel's Catchfly (*S. Armeria*) is a common garden annual that requires sowing in the open ground in March or April.

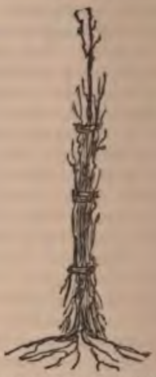
Silk tree.—*Acàcia julibrissina.*—See Acacia.

Si'lphium.—*Compositæ.*—Perennial plants, natives of North America, with yellow flowers, which are quite hardy in British gardens, and will grow in any garden soil.

Simaru'ba.—*Simarubiaceæ.*—The false Quassia. Stove plants with showy flowers, natives of the West Indies, nearly allied to the Quassia.

Single trees and single shrubs are the grand sources of variety in a lawn or park, where the surface is flat and without any other resources; and they are also, when judiciously disposed, valuable additions to a surface naturally varied by undulations. The great art in putting down single trees is, to dispose them so as to form groups, when seen from a distance, and yet so as to produce variety in every change of position in the spectator when near. The kinds of trees and shrubs may be varied at pleasure, provided some attention be paid to the general forms, and to the prevalence of one general form or character of tree or shrub in one place. For example, if conical trees be distributed equally over the grounds, along with round-headed trees, they will produce great sameness; but if conical trees prevail in one place, round-headed trees in another, and flat-spreading trees in a third, so many distinct characters will be produced. The same may be said as to shrubs. The sure mode of proceeding on right principles is to take the different genera, and allow only the species and varieties of one genus to prevail in one place. Single trees should always be planted in prepared soil raised in heaps a foot or more above the general surface; so that after a year or two, when the earth has settled down, the tree may stand on a little hillock. The trees before planting should be ten feet or twelve feet in height, with trunks three inches or four inches in diameter at the surface of the ground. The shrubs should also be of as large a size as will transplant with ease and a fair prospect of success, and this size will vary according to the kind of shrub. Evergreen trees of the Pine and Fir tribe, and of the Cypress tribe, the beauty of which depends on their spreading branches, should either be planted in a situation where no fence is requisite, or they should be surrounded with iron hurdles or some other light fence placed five feet or six feet from the stem of the tree, and extended to a greater distance as the lateral branches advance in length; but broad-leafed trees, such as most of the Exogens, may be protected by fences placed close to the stem. There are various modes of doing this: *fig.* 29 shows the mode of protecting by *tying* thorn branches round the stem as practised in the Regent's Park London, and various other places.

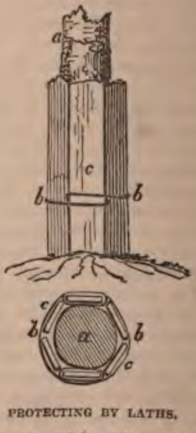
Fig. 29.



PROTECTING BY FAGGOTS.

Fig. 30 shows a mode of protecting trees from sheep by tying lath round them with wire. In th horizontal section, and also in th

Fig. 30.



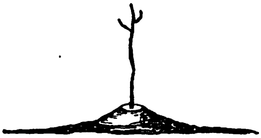
PROTECTING BY LATHS.

elevation, *a*, represents the stem of the tree, *b*, the wire, and *c*, the laths.

To protect single trees from the wind, various modes have been adopted; one of the simplest of which consists in driving a stake into the ground much deeper than the roots of the tree, and tying the trunk to it with a hay-band; care being taken not to injure the roots in driving in the stake. There is another mode of fixing a tree, which serves also to protect it; and this consists in driving two pieces of wood into the ground; with their lower extremities spread out, and their upper ones tied to the tree. Many other methods will be found in the ***Gardener's Magazine***, vol. xiii. and in Mr. Loudon's ***Suburban Gardener***.

In planting single trees, and indeed trees of every kind, the greatest possible care should be taken to place them so high above the surface as that after they have sunk down, as they will do in a few years, they may still appear to stand on a little hillock or to grow out of a small mound. If we examine thriving trees in natural wood, we shall always find that the collar, that is the point of junction between the stem and the root, rises above the general surface, so as to form a little hillock. On the other hand if we examine trees in artificial plantations in which the soil has been deeply trenched, we shall generally find that though they may have been planted at first level with the surface, they will, after a certain number of years, have sunk considerably below the surface; or if care has been taken to keep the ground about them level, by adding fresh soil as the surface sinks they will appear with their collars completely buried and their trunks rising out of the soil like so many posts driven into it by art, instead of springing from a woody base rising above the soil like trees and shrubs in a natural forest, or on a common. In planting single trees, therefore, hillocks should at first be raised to a height which will for a year or two appear quite unnatural, as shown in *fig.* 31, in which may be observed a small hollow at the base of the stem for retaining water; but they will soon sink down to the appearance shown in *fig.* 32.

Fig. 31.



NEWLY PLANTED TREE.

Fig. 32.

FULL GROWN TREE.

Sinni'ngia. — ***Gesneriaceæ.*** — Stove-plants with large bell-shaped flowers. They should be grown in light rich soil.

Siphocampylus.— ***Lobeliaceæ.*** — A suffruticose plant, with red and green tube-shaped flowers. It is generally kept in the greenhouse, but it is nearly hardy. It should be grown in heath-mould, and it is propagated by cuttings, which should be dried a little before they are planted.

Sipho'nia.—***Euphorbiaceæ.***—The American Indian-rubber tree. The first elastic gum brought to Europe was the produce of the ***Ficus elastica;*** and as this plant is a native of the East Indies, the substance was thence called Indian rubber since been found that several trees produce it; and the Caoutchouc used for the Macintosh cloaks, &c. is principally produced by the *Siphònia Cahùchu*, a native of Guiana. The species requires a stove in England; and it grows freely in peat, loam, and sand. It is propagated by cuttings of the young wood in sand, with a bell-glass and bottom-heat.

SISY′MBRIUM. — *Cruciferæ*. — Hedge British weeds.

SISYRI′NCHIUM. —*Irideæ*. — Mustard.—Beautiful little plants, resembling bulbous plants in their flowers, but with fibrous roots. They are all natives of America, and they should be grown in sandy peat.

SKULLCAP.—See SCUTELLA`RIA.

SLIPPER-WORT.—See CALCEOLA`RIA.

SLUGS.—See LIMAX.

SMILAX.—*Smilaceæ*. — Evergreen monocotyledonous, diœcious, climbing shrubs, with curiously ribbed leaves, and numerous tendrils, which they twine round every object within their reach. The roots are thick and fleshy, and from them (and particularly those of one species) the drug called sarsaparilla is made. The flowers are small and whitish; and those of the female plants are succeeded by red or black berries. The handsomest species is *S. rùbens*, the tendrils of which are of a bright red; and the next is *S. excélsa*, from the large size of its leaves. All the species may be grown in the common garden soil; but they should be planted in a shady situation, and kept rather moist. *S. Chìna* and some other species are rather tender, and require protection from severe frosts.

SNAILS.—See HELIX.

SNAIL-FLOWER. — *Phaseòlus Caracalla*.—A climbing plant, a native of India, with lilac flowers, nearly allied to the Scarlet-runner.

SNAKE-GOURD. — *Trichosanthes anguìna*.—A very curious plant, with white flowers, every petal of which appears surrounded with long knotted fringe. The leaves and tendrils resemble those of the common cucumber; but the fruit is curiously striped, and is so long and narrow as to resemble a snake. Specimens have indeed been grown more than six feet long, and not thicker than the body of a common snake. The plant is an annual, a native of China, and it should be grown in a frame like a common cucumber or melon. It is of no use, and only worth cultivating as an object of curiosity.

SNAKE-WOOD. — *Ceanòthus colubrìna*.

SNAP-DRAGON.—See ANTIRRHINUM.

SNOWBALL TREE. — See VIBURNUM.

SNOWBERRY. — See SYMPHORICARPUS.

SNOWDROP.—See GALANTHUS.

SNOWDROP TREE.—See HALESIA.

SNOWFLAKE.—See LEUCOJUM.

SOAP-BERRY.—See SAPINDUS.

SOAP-WORT.—See SAPONARIA.

SOILS—are of two kinds, the surface soils, and the subsoils; the first being what are generally understood by the word soils, and the second being properly designated earths. Soils, according to this definition, consist of the crumbling surface of one of the primitive earths mixed with decayed animal or vegetable matter, and perhaps with particles of some other earth which may have been washed down by rains, or otherwise accidentally mingled with it. Thus clay is one of the primitive earths; but loam, which is compounded of the crumbling surface of the clay mixed with decaying animal or vegetable substances, is a soil. In the like manner, lime is an earth, but chalk is a soil. When several kinds of soil are mixed together and intermingled with manures, the mixture is called a compost. All soils which contain a considerable portion of sand or peat are called light; and all soils containing clay are called loamy. What is called a light rich soil, is generally composed of very sandy loam, mixed with vegetable mould, or the sifted remains of an old hotbed.

Solanum. — *Solanaceæ.* — The Nightshade. The flowers of the plants belonging to this extensive genus all more or less resemble those of the common climbing Nightshade, or Bitter-sweet of the hedges,—and indeed those of the potatoe, which belongs to this genus. They are all rather pretty, but their foliage is too coarse to be ornamental. *S. campanulàtum* is perhaps the handsomest species. Some of the species require a stove, others a greenhouse, and others the open air; but they all agree in liking a rich light soil, and they all grow well in a mixture of loam and peat, enriched with vegetable mould.

Soldanella. — *Primulàceæ.* — Beautiful little alpine plants, very suitable for rockwork, some with purple, and some with blue flowers. They should be grown in heath-mould; or in peat, mixed with very sandy loam; and they are increased by seeds, or by dividing the root. They are generally grown in small pots, and they should neither have too much nor too little water.

Solidago.—*Compositæ.*—Golden Rod. Perennial plants, quite hardy in British gardens, where they flower in autumn. They are too tall for any small garden, and they are only suitable for the back row of a flower-border. They will grow in any common garden soil, and they are increased by dividing the root.

Sollya.— *Pittisporaceæ.* — This beautiful little shrub, though only introduced in 1830, is already as common as the Fuchsia, and it is a favourite everywhere. The leaves are evergreen, and the bright blue bell-shaped flowers, which are produced in tufts near the ends of the branches, are so elegant that no one can see them without admiring them. The plant is a native of New Holland, and it is nearly hardy, as it will stand in the open air if trained against a wall and slightly protected during winter. It is, however, generally grown in pots, in which the only objection to its culture is the circumstance of its having the tips of its shoots frequently covered with aphides, the only cure for which is constant syringing. In the open air it is liable to the attacks of a black insect, similar in its nature to the aphis, but still more disagreeable. It should be grown in peat and loam, or in heath-mould, and it is propagated by seeds or cuttings. The fruit, which is a berry full of seeds, ripens freely; but the cuttings are very difficult to strike, and indeed will rarely succeed without bottom-heat. Besides *Sollya heterophylla*, which is the common kind, two or three other kinds have been introduced by Captain Mangles from the Swan River.

Solomon's Seal.—See **Polygonum.**

Sonchus. — *Compositæ.* — The Sow Thistle. The common herbaceous species is a British weed; but there are two or three shrubby kinds from the Madeira and Canary Isles, with yellow flowers, which are very ornamental. They should be kept in a greenhouse, and grown in light rich soil.

Sopho'ra.— *Leguminosæ.* — The common *Sophòra japónica* is a large tree which grows freely in the neighbourhood of London, and produces its large bunches of cream-coloured flowers in August and September. The drooping Sophora, however, though only considered a variety of the tree, is very distinct. It is a trailing shrub, sending out shoots six feet or eight feet long in a single season; and when it is grafted on a stock of *S. japónica*, ten feet or twelve feet high, these long sweeping shoots, the bark of which is a bright green, have a peculiarly graceful appearance. The Sophora will grow in any soil, but a poor one suits it better than a rich one; and its leaves seldom droop even in the driest seasons.

SOUTHERNWOOD.—See ARTEMISIA.

SOWING.—The operation of committing seeds to the soil in flower-gardening, is commonly done in patches; but sometimes flowers are sown broadcast or in drills, and occasionally singly. When annuals are to be grown in borders containing a miscellaneous assemblage of flowers, they are commonly sown in small circular patches, in intervals left on purpose among the perennials, or among the Roses and other low shrubs. Each patch is prepared by digging up a spadeful of the soil and returning it to its place with the surface downwards; then breaking it finely, and levelling and smoothing the surface; and lastly, depressing or slightly hollowing out a circle from three to six inches in diameter, and from a quarter to a half an inch in depth, according to the size of the seeds to be sown. As most seeds germinate best when gently pressed into the soil, a very good mode for amateurs is to take the saucer of a flower-pot of the diameter of the patch, and gently press down the soil; and then to strew a few seeds on the level surface thus formed. Half-a-dozen seeds will be sufficient, of even the smallest-growing plants, if the seeds are good. The next operation is to sprinkle a little fine soil over the seeds, so as to cover them to about the same thickness as the diameter of the seed. After this, the saucer should be again applied so as to press down the soil and the seeds together; and if there be any danger apprehended from birds or drought, an empty flower-pot should be turned over the patch till the plants come up. The larger seeds of flowers, such as Lupins, Sweet Peas, &c., may be sown three or four in a patch; and some kinds of Lupins, such as *L. Cruickshánkii* and *L. mutábilis*, will not require more than a single seed. In the case of large seeds, and of all the commoner kinds, the use of the saucer for preparing the ground, and of the empty flower-pot as a protection, may be dispensed with.

In sowing broadcast, the bed or space to be covered being stirred up with the spade and raked fine on the surface, should be gently smoothed with the back of the spade, and the seeds afterwards strewed over it, so as to lie, if the seed be good, at an inch or two apart; or less, if the plants are to be thinned out or transplanted. The seeds may then be covered by strewing over them some fine mould; and this may be "firmed," as the gardeners term it, by gently beating the ground flat with the spade. For ordinary seeds, raking the surface smooth before sowing, and after sowing again raking it, will be found sufficient; and the raking should always be light in proportion to the smallness of the seeds. In sowing grass-seeds to form a lawn, the ground should be beaten equally firm throughout, to prevent it from sinking unequally afterwards; and after it has been rendered perfectly smooth and even, the seeds should be sown quite thick, and raked in so gently, that the teeth of the rake may not penetrate more than half an inch into the soil.

Sowing in drills or little furrows drawn by the hoe, is chiefly required for edgings; and, as the plants suited to this purpose are small, and also the seeds, great care ought to be taken to distribute them equally, and not to cover them with too much earth.

Spanish Broom.—*Spártium junceum.*—See **Spartium.**

Spara'xis. — *Irideæ.* — Beautiful bulbous plants, that will flower vigorously if grown in a well-drained bed in the open air. For the mode of forming the bed, see **Ixia.**

Spartium.—*Leguminosæ.*—The Spanish Broom.—A well-known upright shrub, with upright deep green branches, and very few leaves, which soon drop off. The flowers, which are in terminal racemes, are large, and of a deep yellow. It is a native of Spain and Portugal, and, in short, of the whole of the south of Europe; where it grows in rocky situations, and in dry gravelly soils. In England it produces a good effect in a shrubbery, and it will grow vigorously wherever the soil is gravelly or sandy; but it does not thrive in clay, as it has a long tap-root, which it can only send down where the soil is free. It is generally propagated by seeds.

Spatala'nthus. —*Irideæ.* — The Ribbon-flower. A very handsome bulbous plant, requiring the usual treatment of Cape bulbs.—See **Ixia.**

Speedwell.—See **Veronica.**

Spha'gnum. — *Cryptogamia.*— A kind of moss.

Spheno'gynè. — *Compositæ.* — Beautiful annual plants, which only require sowing in March or April, in any common garden soil.

Spider Ophrys.—See **Ophrys.**

Spiderwort.—See **Tradescantia.**

Spindle-tree.—See **Euo'nymus.**

Spiræ'a.—*Rosaceæ.* Hardy shrubs, generally natives of Siberia, with very pretty flowers. The handsomest kinds are, *S. chamædrifolia,* with spike-like corymbs of white flowers; *S. ulmifolia,* with flat corymbs of white flowers and large handsome leaves; *S. hypericifolia,* or Italian May; *S. salicifolia,* Bridewort, or Queen's Needle-work, with spikes of pinkish flowers; *S. bella,* a native of Nepal, with corymbs of beautiful rose-coloured flowers, which it produces in May and June; *S. opulifolia,* the Virginian Guelder Rose, or Nine Bark, a native of North America, with corymbs of rather large white flowers; *S. ariæfolia,* a most beautiful species, a native of California, with loose panicles of feathery whitish flowers, which it produces in July and August; and *S. sorbifolia,* with loose panicles of white flowers and pinnate leaves, from Siberia. All the kinds grow with most luxuriance in moist soil, having a poor and stunted appearance where the soil is dry and gravelly; and they are readily propagated by suckers, which they throw up in great abundance.

Spira'nthes. — *Orchidaceæ.* — Ladies' Traces. Mostly tropical plants, which require a moist stove.—See **Orchideous Epiphytes.**

Spleenwort.—*Asplenium.* Very beautiful ferns, which differ very much in their appearance, though they are all very handsome. They require, like all other ferns, to be grown in moist shady places.

Spondias.—*Terebinthaceæ.*—The Hog-plum. West Indian trees, which require a stove in England, and which grow freely in a mixture of loam and peat.

Sprekelia. — *Amaryllidaceæ.* — The Jacobæà Lily. A bulbous-rooted plant, with splendid dark scarlet flowers. It is called Jacobæa, on account of the brilliant scarlet of its flowers, which the Spaniards in Peru thought resembled the scarlet swords worn by the knights of the order of St. James (Jacobæus). For the culture, see **Amaryllis.**

Spurge.—See **Euphorbia.**

Spurge Laurel.—See **Daphnè.**

Squill.—See **Scilla.**

SQUIRTING CUCUMBER.—See MOMORDICA.

STACHYS.—*Labiatæ.*—The Hedge Nettle. Shrubby and herbaceous plants, natives of Europe and North America, which will grow freely in any light rich soil, and which are increased by cuttings or division of the root.

STAFF TREE.—See CELASTRUS.

STAG'S HORN.—See RHUS.

STANHOPEA.—*Orchidaceæ.*—Beautiful Orchideous plants with large white flowers proceeding from the root. For the culture, see ORCHIDEOUS EPIPHYTES.

STAPE`LIA.—*Asclepiadeæ.*—Very curious stove-plants, with showy flowers proceeding from the root, which smell so much like carrion, that flesh-flies have been known to lay their eggs upon them. As these plants are very succulent, they are very apt to drop off, if they are grown in rich soil, or too much watered. They succeed best in sandy loam mixed with lime rubbish; and they are propagated by cuttings, which should be laid on a shelf for two or three days to shrivel before they are planted. The plants from which the cuttings are taken should be kept quite dry for some time afterwards, as they are apt to rot from the wound. All the Stapelias are natives of the Cape of Good Hope.

STAPHYLIA.—*Celastrineæ.*—The Bladder Nut. Hardy shrubs, natives of England and North America, that will grow freely in any common garden soil. The flowers are white, and the seed, which is brown, is produced in a large inflated capsule or bladder. The seeds, when bored, are used in Catholic countries for rosaries.

STAR OF BETHLEHEM.—See ORNITHOGALUM. In the midland counties the large yellow Hypericum is called the Star of Bethlehem.

STARWORT.—See ASTER.

STATICE`.—*Plumbagineæ.*—Sea Lavender. Singular plants, the footstalks of the flowers of which are coloured so as to resemble flowers, while the real flowers are the white part at the extremity of the purple. The handsomest species belonging to the genus is *S. arborea*, a native of the Canaries, which is quite shrubby. This splendid plant should have plenty of room for its roots; and thus when there is not a conservatory for it to be planted in, it does better in the open border with a slight protection during winter than in a pot in a greenhouse. The soil in which it is grown should be half sandy loam and half vegetable mould. It is extremely difficult to raise young plants by cuttings; and though nurserymen contrive to make layers, it is so difficult an operation, as to be scarcely practicable by an amateur. The common kinds of Staticè are generally increased by seeds, or by dividing the root; and they should be allowed plenty of space, as they are easily killed when crowded by other plants.

STELLARIA.—*Caryophylleæ.*—Stitchwort. Very pretty plants, with white flowers, many of which are natives of Britain. They are all quite hardy, but they grow best in sandy soil. The dwarf kinds are very suitable for rockwork. They are propagated by seeds, which they ripen freely, or by division of the root.

STENOCHIS.—*Compositæ.*—*S. speciòsa* is a very showy perennial, with large and very handsome flowers. It is a native of California, and will grow in any common garden soil. It is increased by seed, or by dividing the roots.

STENOCHILUS.—*Myoporineæ.*—Australian shrubs, with scarlet flowers, which should be grown in sandy peat.

STERCU`LIA.—*Byttneriaceæ.*—Stove

shrubs and low trees from the East and West Indies, with greenish or whitish flowers. They should be grown in peat and loam; and they are propagated by cuttings of the ripe wood, not deprived of their leaves, which should be struck in sand, under a bell-glass, with bottom-heat.

Sternbe'rgia.—*Amaryllidaceæ.*—Hardy bulbs, with showy yellow flowers; which only need planting in the open border.

Ste'via.—*Compositæ.* — Mexican perennials with tufts of very pretty white or pinkish flowers, which should be grown in sandy peat, and which require a little protection during winter. S. Eupatorium is a very pretty plant for filling a bed in a geometric flower-garden, from its compact habit of growth, and the abundance of its flowers.

Stirring the soil is an operation of considerable importance in the case of all plants in a high state of culture, and especially of young plants. When soil is loosened to the depth of even two or three inches, it admits the air and the rain beneath the surface; and both, in this manner, convey their temperature to the soil, as well as their nutritive qualities to the roots. It is also remarkable that though soil when loosened is advantageous in communicating a warmer temperature and moisture to what is below by admitting the air and the rain; yet that in the heat of summer, plants growing in a soil the surface of which is kept loose, suffer less either from excess in heat or the want of rain, than plants in a soil which is kept firm. This will also apply to a certain extent to plants in pots, though stirring the soil is of far less importance to them than to plants in the open ground; as the heat of the surrounding atmosphere, whether it be advantageous or injurious, penetrates readily through the sides of the pots, and the superfluous moisture is exhaled in the same manner. In stirring the soil among plants in the open ground, it must, however, be always remembered that the soil is full of roots, and therefore that the stirring must not be carried to more than a few inches in depth. It should also be performed with a fork rather than with a spade, in order that none of the roots may be cut. The soil should never be stirred, except when it is in a dry state, and when rain is not expected; because should the soil be in a wet state when it is moved, or should rain occur immediately afterwards, it will defeat the end in view; viz. that of forming a porous surface layer, readily permeable by air and water.

Stitchwort.—See **Stellaria.**

Stock.—See **Mathiola.**

Stove-crop.—See **Sedum.**

Storax.—See **Styrax.**

Stork's Bill.—See **Geranium.**

Stramonium.—*Solanaceæ.* — The Thorn Apple. Large showy plants, conspicuous alike for their leaves, flowers, and fruit. They grow best in chalk or a calcareous loam; and they are so completely hardy in Britain, and grow so freely from seed, that the common kind has become naturalised, and is frequently found growing wild. When these plants are grown in gardens, they should be allowed plenty of room, as their principal beauty is the wide-spreading and luxuriant character of their foliage.

Stranvasia. — *Rosaceæ.* — The new name for *Cratægus glauca*, an evergreen tree, a native of Nepal, with glaucous leaves, woolly beneath, and white flowers. It appears to be hardy, or very nearly so, and it is very handsome. It is generally propagated by grafting on the common Hawthorn.

Strawberry Blite.—See **Blitum**

Strawberry tree.—See Ar'butus.

Strelitzia.—*Musaceæ.*—Magnificent plants with large long leaves, and very large and singular orange and purple flowers. They are generally kept in a stove, but they will flower in greenhouse or room, if kept sufficiently moist. They should be grown in light sandy loam. They are very difficult to propagate, but they sometimes send up suckers, and sometimes ripen seeds.

Strepta'nthera.—*Irideæ.*—Cape bulbs with very showy flowers; which may either be grown in pots, or in beds in the open air.—See Ixia.

Streptoca'rpus.–*Bignoniaceæ.*—A very handsome perennial plant from South Africa, which requires a stove in England; but which when properly treated produces its beautiful and elegant pale purple flowers in great abundance. It is nearly allied to Gloxinia; but it has twisted seed-pods. It should be grown in equal parts of peat, loam, and sand; and it is increased by seeds, which it ripens freely.

St'ipa.—*Gramineæ.*—*Stìpa pinnàta*, the Feather-grass, is an extremely elegant plant which grows freely in light rich soil, and is increased by seed, or division of the root.

Stuartia.—*Ternstræmiaceæ.*—A North American shrub or low tree, with large white flowers, nearly allied to Malachodendron. It will grow in any common garden soil that is tolerably light, and it flowers freely. It is propagated by layers, or cuttings.—See Malachodendron.

Styli'dium.—*Stylideæ.*—Australian shrubs and perennials, generally kept in a greenhouse, with small pinkish or purple flowers, the stamens of which are irritable, and move when touched. All the species should be grown in sandy peat, or eath mould; and the perennials are propagated by seeds or division of the root, and the shrubby species by cuttings.

Styrax.—*Styracineæ.*—Storax. Ornamental shrubs, with white flowers, natives of Europe and North America; which grow best in sandy peat, or heath mould, and flower freely. They are propagated by layers.

Succisa.—See Scabiosa.

Succory.—*Cichórium Intybus* is a British plant, with brilliant blue flowers, which grows freely in sandy soils, and which may be grown with the greatest ease in gardens.

Succulent plants are those which have both their stems and leaves provided with so few stomata or breathing pores, as to be able to retain a great portion of the moisture which is evaporated by other plants. These plants are generally natives of sandy deserts, where for half the year they are entirely destitute of water, and where their capability of retaining moisture is necessary to keep them alive. When grown in Europe, they are well adapted for sitting-rooms, as they are capable of bearing a greater degree of dryness in the air than most other plants; but they are very liable to be injured by too much water, as in the cloudy atmosphere of England their stomata are not sufficiently numerous to enable them to throw it off; and it rots them, or, as gardeners express it, they damp off. All succulent plants when grown in pots should have abundant drainage, and should never be suffered to stand with water in the saucer; and the soil in which they are grown should be mixed with sand or lime rubbish to keep it open, and in a state fit for their roots to penetrate through it.

Sugar-cane.—See Sa'ccharum.

Sumach.—See Rhus.

Summer Cypress.—See Kochia.

Sundew.—See Dro'sera.

Sunflower.—See Helianthus.

Sun-rose.—See Helianthemum.

Sutherlandia.— *Leguminosæ.*— A pea-flowered shrub, with scarlet flowers, formerly called *Colutea frutescens;* a native of the Cape of Good Hope, which is half-hardy in British gardens, and which should be grown in sandy loam.

Swainsonia. — *Leguminosæ.* — Pea-flowered shrubs, natives of Australia, with purplish flowers, which should be kept in a greenhouse, and grown in heath mould.—See Australian shrubs.

Swallow-wort.—See Asclepias, and Chelidonium.

Sweet Bay.—See Laurus.

Sweet Briar.—See Ro'sa.

Sweet Gale.—See Myrica.

Sweet Marjoram.—See Origanum.

Sweet Pea.—See Lathyrus.

Sweet Potato.—*Batatis edulis.* —A tuberous-rooted plant, formerly considered to belong to Convolvulus, then to Ipomæa, but now separated from both. It is a native of South America, where it is called Batatis; and it requires a stove in England.

Sweet Sop, or Custard Apple.— See Anona.

Sweet Sultan.—See Amberbo'a, and Centaure'a.

Sweet William.—*Diánthus barbàtus.*—See Dianthus.

Swietenia.—*Cedrelaceæ* or *Meliaceæ.*—The Mahogany tree. A tree, a native of the West Indies, requiring a stove in England. It is grown in loam and peat, and is propagated by cuttings. The flowers are reddish, but have no beauty.

Sword Fern.—*Xiphópteris serrulàta.*—A native of the West Indies.

Symphoria.—*Caprifoliaceæ.*—St. Peter's Wort. Bushy, deciduous shrubs, which grow so freely in any common garden soil, and send up so many suckers, that when once planted, it is difficult to eradicate them. The flowers of *S. glomerata* are produced in clusters, and the berries are small and reddish. *S. racemòsus*, the Snow-berry, has pinkish flowers, which are disposed in such loose racemes as to appear almost solitary; and which are succeeded by large white berries which are very ornamental. There is another species, *S. occidentalis*, with very large leaves, and drooping racemes of flowers, which has not yet been introduced. All the kinds are natives of North America. S. racemosus is sometimes grafted on *Lonicera Xylosteum*, to avoid the inconvenience of its numerous suckers.

Symphoricarpos.—Michaux's name for the Snowberry.—See Symphoria.

Syngenecious plants. Plants belonging to the 19th class of the Linnean system, and the natural order Compositæ.

Syringa. —*Oleineæ.*—The Lilac. —Well-known deciduous shrubs, with purplish or white flowers, natives of Europe and the colder parts of Asia, and valuable in British shrubberies for the early appearance of their leaves in spring, and for the beauty and fragrance of their flowers. There are several species and varieties, varying principally in the colour of the flowers. They are all quite hardy in British gardens, and they will grow in any common soil. They are propagated by layers and suckers, which they produce in great abundance.

T.

Tabernæmontana. — *Apocyneæ.* —Trees and shrubs from the East and West Indies, which require a stove in England. They have generally white fragrant flowers, resembling those of the common Jasmine, but are many times larger. They should be grown in loam and peat; and they are propagated by cuttings which require a moist heat to make them strike.

Tacamahac.—The Indian name for the Balsam Poplar; a species that should be cultivated in ornamental plantations for the beautiful yellowish green of its leaves, which appear very early in spring.

Tacsonia. — *Passifloraceæ.* — Climbing plants, nearly allied to the Passion Flower, with pinkish flowers and golden, ball-like fruit. They are generally kept in a stove, but they will both grow and flower freely in greenhouse-heat. They should be grown in sandy loam and peat, and they are propagated by cuttings.

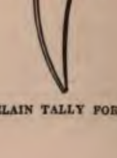
Tagetes. — *Compositæ.* — The French and African Marigolds. Well-known half-hardy annuals with showy flowers that have a very disagreeable smell. The seeds are generally sown on a slight hot-bed, and transplanted in May.

Talauma.—*Magnoliaceæ.*— Low trees and shrubs from Java and other parts of the East Indies, with very fragrant white flowers, nearly allied to the Magnolias. The plants should be grown in loam and peat if kept in the stove, and they may be propagated by layers and cuttings; but by inarching them on *Magnòlia purpùrea*, they may be brought to flower in a conservatory or greenhouse.

Talinum.—*Portulaceæ.*— Succulent plants, shrubby and perennial, mostly natives of the West Indies, and with dark red or purple flowers. They should be grown in sandy peat with a little loam, and they require but little water. They are propagated by cuttings.

Tallies for plants—are of various kinds, according as the plant is large or small, grown in the open air or under glass, and according as the object is of a permanent or temporary nature. Tallies for trees, as in the case of an Arboretum, which is to endure for many years, are formed of iron, stone, or brick; those for herbaceous plants, of iron or wood; and those for plants, in pots kept in houses, of porcelain, wood, lead, zinc, and sometimes, though rarely, of iron. Tallies for plants kept in nurseries in pots, are commonly of wood, on which a little white paint is rubbed with the finger, and the name written with a black-lead pencil; those for plants taken up and packed to be sent to a distance, are commonly of parchment, with the name written in ink; but nursery labels are formed of wood and tied to trees, or of pieces of lead stamped with numbers. The object in every case connected with the nursery business is simply to identify the species or variety; but in the case of private gardens, it is not only to do this, but to produce an object that shall not be unsightly in a garden. For this latter purpose, porcelain tallies (*fig.* 33), which are

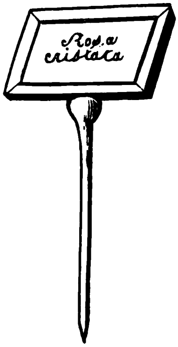
FIG. 33.



PORCELAIN TALLY FOR POTS.

formed of various sizes and shapes, are best for pots; and tallies of cast-iron, with panels for tablets containing the names, to be covered with glass (*fig.* 34), are the most efficient for plants in the open ground. Where it is not desired to display the name, the simplest and least expensive mode is to mark a number on a wood tally or stick, and this may be done either by notching the stick with a knife, which is the common practice among gardeners; or by cutting a portion of it smooth, rubbing it with a little white lead (white paint), and writing the number while it is yet moist with a black-lead pencil. Of all the different modes which have hitherto been devised of naming or numbering plants in gardens (and they amount, perhaps, to hundreds), the mode by a stick, white lead, and a black lead pencil, is, perhaps, the best for private gardens; and it is, undoubtedly, by far the cheapest. In numbering or naming plants in a garden, where good taste ought to preside, it must always be recollected that the means ought to be kept subordinate to the end, and that the names of plants should in no private garden be more conspicuous than the plants themselves. The cheapest kind of Tally is a thin strip of zinc, pointed with white-lead, and then written on with a lead pencil; and these strips of zinc may be had cut into the proper sizes, at the zinc manufacturer's in the New Road.

FIG. 34.



CAST-IRON OR ZINC TALLY FOR THE OPEN GROUND.

Tallow-tree.—*Stillégia sebifera.* A stove-plant, which should be grown in peat and loam. It belongs to Euphorbiaceæ.

Tamarind Tree.—See **Tamarindus.**

Tamarindus. — *Leguminosæ.* — The Tamarind Tree. There are two kinds of Tamarinds; *T. índica*, a native of the East Indies, with yellow flowers striped with red, and *T. occidentàlis*, a native of the West Indies, the flowers of which are white. Both kinds, however, very rarely flower in this country, probably because the trees have not sufficient room for their roots. The plants may be raised from seeds of preserved Tamarinds sown in a hot-bed; and they are worth growing for their handsome foliage. They require a strong heat and a rich soil, and they should be supplied with plenty of water. The soil should be composed of equal parts of fresh turfy loam and vegetable mould or rotten dung, with a little sand or peat, and these ingredients should be well mixed together before the compost is used. Young plants may also be raised from cuttings, which strike freely in sand with the help of bottom-heat.

Tamarix.—*Tamariscíneæ.*—The Tamarisk. Tall shrubs, mostly natives of Europe, which are sub-evergreen, and useful in withstanding the sea-breeze. A great many species are enumerated in books; but only two are common in British gardens. These are *Támarix gállica*, the French Tamarisk; and *T. germanica*, L.—

(*Myricària germánica*, Desv.), the German Tamarisk. The French Tamarisk is by far the handsomest, and as it will thrive close to the sea-shore, and produces its long terminal spikes of pinkish flowers in autumn, when people generally visit the coast, it is a most valuable shrub for the gardens of sea-port towns. It should be grown in a deep sandy soil, and it is propagated by cuttings taken off in autumn.

TAMUS.—*Dioscoriaceæ* or *Tameæ*.—The Black Bryony. There are two kinds of Bryony common in English woods very different in the eyes of a botanist, but bearing considerable resemblance to each other in the eyes of an amateur. They are both found wild in hedges and thickets, through which they contrive to insinuate their long slender stems and branches, hanging from tree to tree; they have both greenish - white inconspicuous flowers; the fruit of both consists of bunches of showy red berries; and both of which have tuberous roots, of a very acrid nature. They are also both diœcious; but this is the only botanical resemblance between them. The White Bryony (*Bryònia dioìca*) belongs to the Natural Order Cucurbitaceæ, and it is the only British plant belonging to that order. Its leaves are rough and palmate; its flowers have a calyx and a corolla, both of which are five-cleft, and its stem is climbing and furnished with numerous tendrils. The Black Bryony (*Tàmus commùnis*) has, on the contrary, smooth, shining, heart-shaped leaves of a very deep and glossy green; the flowers consist of only one covering, which is six-cleft, and its stem is twining without tendrils. The names of Black and White Bryony allude to the colour of the skin covering the roots, which in one species is black and in the other white. The root of the White Bryony may easily be made to grow in any shape that may be wished by placing it when young in an earthenware mould. This curious property was formerly frequently taken advantage of by designing people, who having thus obtained roots of frightful forms, showed them for money as natural curiosities. The Black Bryony belongs to the same natural order as the Yam. For the Elephant's-foot, which was formerly considered to belong to the genus Tamus, see TESTUDINARIA.

TAN.—The bark of Oak or of other trees, after it has been used by tanners. When it is received by gardeners from the tan-pits, it is generally wet and without heat; but after it has been laid in a ridge in an open shed for two or three weeks, and turned over two or three times, it becomes drier and begins to ferment, when heat is evolved in a greater or lesser degree according to the size of the mass. In this state it is fit to be introduced into pits or beds in hothouses for the purpose of supplying bottom-heat. For ordinary purposes the bed or layer of tan need not be thicker than eighteen inches or two feet, but when a very powerful heat is required, double that thickness is desirable. The pots in which the plants are contained, when large, should at first not be plunged more than half their depth in the tan; or even, in some cases, they should be set on its surface. But after the first violent heat has subsided, they may be plunged to the brim. When the heap begins to cool, in consequence of the fermentation diminishing, the tan may be turned over and the pots replunged, adding a little fresh tan, if necessary, to keep the pit to the proper degree of fulness. When the heat subsides a second time, the tan may be again turned and a larger portion of fresh material added; and the third time the old tan may be sifted in turning, and afterwards mixed with new. To prolong the heat in tan by diminishing the intensity of the fermentation, common salt is sometimes added; and to increase the fermentation, yeast, though rather an expensive material, is sometimes mixed with it. The heat of the tan-bed should generally exceed the heat of the atmosphere of the house by from 3° to 10°, according to circumstances; and it should seldom be lower than 60°, or higher than 75° or 80°. In general, a tan-pit or bed requires to be turned three or four times a year; and if salt is sprinkled over it each time, the fermentation will be so far retarded that the bed will retain its heat for a twelvemonth. For the purpose of growing Pine Apples or large hot-house plants, oak or other leaves, or even dung, may be substituted for tan; but for the purpose of striking cuttings, tan is greatly preferable, because the heat produced is not accompanied with so much moisture, and hence the cuttings are not liable to be damped off. In situations where tan or leaves cannot be procured, sawdust is an excellent substitute, and even the husks of oats. Sawdust is an excellent medium for the striking Epacrideæ and the Cape Heaths; the heat being more gentle and regular than with most other fermentating substances. When tan has lost the greater part of its heat, it then forms an excellent medium for striking fleshy-leaved plants, such as Bromelia, which require rather a dry heat, and a medium which undergoes the least possible change in respect to moisture.

Tanacetum.—*Compositæ.* — The Tansy. Herbaceous plants, which are quite hardy in any common garden soil, and which are increased by dividing the roots.

Tangier Pea.—*Láthyrus Tingitánus.*—See Lathyrus.

Tansy.—See Tanacetum.

Taxodium.—*Coniferæ.*—See Deciduous Cypress.

Taxus.—*Coniferæ.* — The Yew. The common yew is too large a tree to be noticed here; but the Irish yew, from its erect form and broad leaves, makes a very handsome plant, which, from the slowness of its growth, may for a long time be almost considered a shrub. There are also some Japan and Chinese species (some of which are now included in the genus *Podocarpus*), which are very ornamental. They will all grow in any garden soil, and are raised by seeds.

Teak Wood.—See Tectona.

Tea Tree.—See Thea. The Duke of Argyle's tea-tree, *Ly'cium bárbarum*, is often called the Tea-tree in gardens, from the following droll mistake. A Duke of Argyle, who lived about a hundred years ago, and who was a great patron of gardening and botany, sent out to China for the tea-tree, which was obtained; but unfortunately the voyage home being very rough, the label was transferred accidentally to a plant of the *Ly'cium bárbarum*, which had been obtained from the coast of Barbary. The real tea-plant died before it reached England, and the Lycium being at that time unknown in Britain, it was supposed to be the tea-tree, till an examination of dried specimens, &c., proved the mistake.

Tecoma. — *Bignoniaceæ.* — The Trumpet Flower. All the species which now compose the genus Tecoma were formerly well known under the name of Bignonia, particularly *T. rádicans*, the common trumpet-flower, which is quite hardy in British gardens, and *T. grandiflóra*, which is nearly so. Some of the species require a greenhouse, and some a stove; but they all grow freely in a rich, light, loamy soil, and they are all propagated by cuttings of the roots.

Tectòna. — *Verbenaceæ.*— The Teak-wood. *T. grándis* is a timber-tree in the East Indies, and almost the only tree in that country fit for ship-building. In England, however, it is a stove-plant, which requires a strong heat to make it grow. It should be grown in loam and peat, and it is propagated by cuttings. The flowers are white.

Telo'pea. — *Proteaceæ.* — The Warratah. The brilliant scarlet flowers of this plant, which are conspicuous even at a great distance, are said to have been one cause why the coast of New South Wales was distinguished by its first visitors as Botany Bay, in allusion to the great accession to botany likely to be derived from a country where the plants appeared so different to those of Europe. The flower of the Warratah may be compared to a gigantic head of clover of the most intense and brilliant scarlet; but it is not common in England, probably because it is a very difficult plant to manage. The first point to be attended to is to have the pot in which it is grown thoroughly well drained; and the next to allow it abundance of light and air. It is generally kept in a stove in England; but it succeeds better in a greenhouse, at least during the summer months; as it is very apt to become covered with insects if it is kept all the year in a hothouse. It is propagated by cuttings or suckers, which it throws up in abundance; and it should be grown in heath mould, mixed with white sand and a little loam. It should be regularly watered in the flowering season; but it may be kept almost dry during the winter months.

Templetonia. — *Leguminosæ.* — Australian shrubs, with red pea flowers, which require a greenhouse in England, and which should be grown in sandy peat.

Tenòria. — *Umbelliferæ.* — The shrubby species of Hare's Ear.—See **Bupleurum.**

Tenthre'do.—See **Sawfly.**

Testudinaria. — *Dioscoreæ.* — Elephant's-foot, or Hottentot Bread. A very singular plant, with an enormous scaly root above ground, from which issues a slender stem, with small flowers. The plant is a native of the Cape, from which country roots are frequently received. It should have a season of complete repose, without any water being given to it when it is not in a growing state; and it should be grown in a mixture of equal parts of turfy loam, peat, and sand; the large, scaly root being placed on the surface of the soil, and not buried in it. The earth in the pot should be then watered and kept moist till the fibrous roots begin to appear, after which less water should be given till the slender stem appears, when the soil in the pot should be watered regularly and abundantly; but no water should ever be poured on the scaly root. The flowers are diœcious, and have never yet produced seed in England. The substance of the scaly root is farinaceous, and it is said to be used by the Hottentots as food. The plant has never been propagated in England; all the plants grown in this country having been received in the state of dry roots from the Cape.

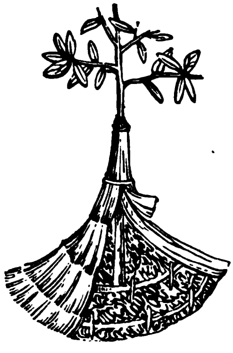
Teucrium.—*Labiatæ.*—The Germander. Hardy, half-hardy, and tender perennial, biennial, annual, and shrubby plants, the smaller kinds of which are suitable for rockwork. Some of the kinds are showy border-flowers; and others handsome greenhouse shrubs, particularly those that are natives of Madeira. *T. Betonicum* is perhaps one of the best of these, as it has loose spikes of fragrant crimson flowers. All the species require a light rich soil; and they are propagated by seeds, cuttings, or division of the roots, according to their respective kinds.

Thalia.—*Cannæ.*—*T. dealbata* is an aquatic plant, a native of South Carolina, with very curious black and white fragrant flowers. It is about as hardy as *Cálla ethiòpica*, and requires the same treatment. — See Arum.

Thalictrum.—*Ranunculaceæ.*—Meadow Rue. Perennial plants, natives of Europe and North America, which are quite hardy in British gardens. *T. aquilegifolium* and its varieties are very showy border-flowers; and *T. alpìnum*, and some other dwarf species, are elegant plants for rockwork. They all grow freely in any common garden soil.

Thatching is sometimes applied as a protection to half-hardy trees in the open ground. Many half-hardy trees and shrubs may be protected from any danger from frost by laying straw over the roots and collar of the stem, and then thatching it, as shown in *Fig.* 35.

Fig. 35.



PROTECTING HALF-HARDY TREES BY THATCHING.

Thea.—*Ternstrœmiaceæ.*—Evergreen half-hardy shrubs, natives of China, and nearly allied to the Camellia, from which indeed they differ only slightly in the capsule. They are only half-hardy in British gardens. *Thea Bohea*, indeed, requires protection every winter; but *T. víridis* will live in the open air with very slight protection (such as laying straw, &c., over the roots) in severe frosts. The flowers of both kinds resemble those of small single white Camellias; and they are cultivated more from the curiosity which most persons feel to see the plants producing tea, than from any real beauty they possess.

Theobro'ma. — *Byttneriaceæ.* — The Chocolate-nut Tree. The tree from the nuts of which cocoa and chocolate are prepared, comes very appropriately after the Tea Tree. There are three species, all natives of South America, with brownish flowers; all of which require a stove in England, and should be grown in light rich soil.

Theophrasta.--*Apocyneæ.*--Stove plants with very handsome leaves and white flowers. They are grown in loam and peat, and they are propagated by cuttings.

Thermometer. — No amateur should attempt to grow plants in a greenhouse or stove, or even in a hotbed, without being provided with a thermometer to regulate the degree of heat. A very ingenious one with a long tube for plunging into the ground has been contrived for ascertaining the heat of a hotbed or tanpit.

Thermopsis. — *Leguminosæ.* — Herbaceous plants with yellow flowers, natives of Europe and North America, which should be grown in very rich soil, but which are quite hardy in the open air in Britain. There is one ligneous species, *Thermopsis laburnifòlia*, D. Don, (*Anagỳris indica*, Willd.,) but it is now generally called *Piptanthus nepa-*

lensis. (See Piptanthus.) None of the species belonging to this genus will thrive unless they are grown in very rich mould.

Thistle.—See Carduus.

Thomasia. — *Byttneriaceæ.* — Pretty little Australian shrubs, formerly called *Lasiopétalum.* They should be grown in sandy peat, and kept in a greenhouse.

Thorn Apple.—See Datura and Stramonium.

Thrift.—*Státicè Armeria*, Lin.; *Armeria vulgàris*, Willd.—See Armeria.

Thrips.—Very small flies, not above a line in length, and which seem rather to leap than to fly away when it is attempted to catch them; throwing up the lower part of their bodies at the same time, as though they curled themselves up to take a spring. They are very destructive, and attack both leaves and petals, causing both to curl up, and afterwards to turn yellow and drop off. The larvæ are nearly as large as the perfect insect, and of a pale yellow; and the insect itself is first yellowish, but afterwards becomes black. As soon as the ravages of these little creatures are perceived, the plants they have attacked should be well and frequently syringed, and exposed as much as possible to the free air; hand-picking in their case being of little avail, from the very small size of the insects and their extraordinary activity.

Throatwort.—See Trachelium.

Thuja.—*Coniferæ.*—The Arbor Vitæ. There are two kinds of Arbor Vitæ common in British gardens, the American (*Thuja occidentalis*), and the Chinese (*T. orientalis*), both having several varieties. The American species is an open-growing tree with horizontal branches; and in America, where it is called the White Cedar, it grows in swamps. The Chinese Arbor Vitæ, on the contrary, is a close-growing tree, with upright branches, and should be grown in a dry soil. Both are quite hardy in the climate of London, and both are propagated by layers and cuttings; the former taking two years to root, and the latter being very difficult to strike. Besides these there are several other species, most of which require a greenhouse or protection during winter. The principal of these are *Thuja pendula* and *T. articulata*, Desf. (*Callìtris quadrivalvis*, Vent.); the latter species, which is a native of Mount Atlas, in Barbary, producing the gum Sandarach, and being the celebrated Spanish wood *Alerce*, which is so hard that it is said to resist fire, and of which the cathedral of Cordova was built. It is also supposed to have been the sandal-wood of the ancients.

Thunbergia.—*Acanthaceæ.*—The beautiful climbing plants generally known by this name differ very much in the colour of their flowers, though very little in their shape. Some botanists divide them into three genera. *T. Hawtayneana*, with dark-purplish flowers, they call Meyenia; and of *T. coccinea*, with three other nearly-allied species, they have formed the genus Hexacentris; while they leave *T. grandiflora*, with dark blue flowers, *T. fragrans*, the flowers of which are white and sweet-scented, *T. aurantiàca*, with orange flowers, and *T. alata*, with buff flowers, with its white-flowered variety, in the genus Thunbergia. *T. alata*, and *T. aurantiàca*, which is probably only a darker-coloured variety, are the most common of these kinds, and they may be grown either as stove or greenhouse climbers, or as half-hardy annuals. *T. alata* is a native of the East Indies, and when treated as either a greenhouse or a stove plant, it is very apt to be covered with the red spider (see Acarus); but these insects seldom appear upon it when it is grown in the open air. When treated as an annual, the seeds should be sown in January on a slight hotbed, or in a sheltered situation in the open ground. The best soil for them is equal parts of peat and silver sand, to which a little vegetable mould may be added. The soil should be kept moist, but it should be well drained, as the plants will perish if either kept too dry or suffered to have their roots in stagnant water. When planted in the open air, where they are finally to remain, the long shoots should be pegged down at the joints all over the bed; and thus treated they will send up innumerable flower-stalks, so as to make the whole bed appear a mass of flowers. *T. aurantiàca* may be treated in the same manner; but *T. a. albiflòra* is rather more tender, and appears generally to succeed better in a greenhouse than in the open air. When these plants are grown in a stove and beset with the red spider, the only way to destroy it is to syringe them with water heated to 120°. The other species of Thunbergia are always kept in the stove, and I believe have never been treated as annuals, though most of them seed freely. They are grown in loam and peat, and are propagated by cuttings.

Thyme.—See Thymus.

Thy'mus.—*Labiatæ.*—The Thyme. Fragrant dwarf shrubs, very suitable for rockwork. *T. grandiflòra* is, perhaps, the most ornamental. They should be grown in light rich soil, and are increased by dividing the root.

Thysano'tus. — *Asphodeleæ.* — Australian plants, with very singularly fringed flowers. The flowers expand about eight o'clock in the morning, and they close at two, never remaining unclosed longer than six hours. They are grown in a greenhouse or stove, in sandy loam and peat; and, like all the Australian plants, care should be taken not to let them suffer from any excess, either of drought or moisture. They are propagated either by division of the root, or by seed.

Tiger Flower.—See Tigridia.

Tigri'dia.—*Irideæ.*—The Tiger Flower. The commonest species of this splendid bulb was formerly called *Ferraria Tigridia*, but it is now changed to *Tigridia pavonia:* there is a variety called *T. p. leone*, and a second species called *T. conchiflora.* They are all extremely handsome, producing abundance of their magnificent flówers in the open ground, which, however, are very short-lived, seldom remaining expanded more than a few hours. The plants are natives of Mexico, and the bulbs may be suffered to remain in the ground all the year if they can be kept dry; there being more danger of their being destroyed by wet than frost. The best mode of treating them is perhaps that recommended for the Ixia. (See Ixia.)

Tile-root.—See Geissorhiza.

Tilla'ndsia. — *Bromeliaceæ.* — Very curious stove-plants, most of which are parasitical, and may be treated like the stove *Orchidaceæ.* (See Orchideous Epiphytes.) The others may be potted in a mixture of peat and loam, and propagated by suckers. They have all showy flowers, which they produce abundantly.

Toad-flax.—See Linaria.

Tobacco.—See Nicotiana.

Tolpis.—See Hawkweed.

Tonquin Bean.—*Dipterix odorata*, Schreb.—(*Baryosma Tongo*, Gært.)—A leguminous plant, of no beauty in its flowers, which are purple, but cultivated for its bean-like seeds, which are remarkably fragrant. It is a native of Guiana, where it is a tall tree; and it requires a stove in England, where it may be grown in a compost of peat and loam.

Toothache-tree.—See Xanthoxylon.

Topiary.—The art of cutting yews and other trees into curious shapes, by putting a wire frame-work over them, and then clipping the trees into the desired form. This art was practised to such an extent in ancient Rome, that the word for topiarist was used as synonymous with that for gardener.

Tore'nia. — *Scrophularineæ.* — Australian plants, with pretty flowers, which require to be kept in a greenhouse, and grown in sandy loam. One species is a half-hardy annual, which may be raised on a hotbed, and planted out in May.

Torreya.—*Coniferæ.* — A very handsome evergreen tree, a native of Florida in North America, nearly allied to the yew, and forming a link between that tree and the hemlock spruce. The first specimen seen in Europe was sent in October 1840, from A. J. Downing, Esq., of New York, to Mr. Loudon, and was presented by him to Mr. Masters, nurseryman, of Canterbury. It is said to be hardy, and to grow in any common garden soil.

Tormenti'lla.-*Rosaceæ.*—British plants with yellow flowers, which, though weeds, look very well on rock-work. The double-flowered variety of *T. erecta* is very ornamental.

To'rtula.—*Cryptogamia Musci.* —Wall-moss. A kind of moss, very useful in making moss-houses, from the brightness and variety of its colours; some of the species being of a dark blue-green, others of a rich yellowish green, others of a very pale pea-green, and one of a dark rich brown. They are all common in Britain.

Touch-me-not.—See Impatiens.

Tournefo'rtia. — *Boragineæ.*— Hothouse and greenhouse shrubs, and hardy and half-hardy perennials, natives of South America. *T. Messerschmidia* is a greenhouse shrub, with very fragrant flowers, which have no beauty; and *T. heliotropioides* is a half-hardy perennial, strongly resembling the Heliotrope in its flowers, but without any fragrance. They are all free-growing plants in sandy loam, and they are propagated by cuttings.

Trache'lium. — *Campanulaceæ.* —Throatwort. The most common species, *T. cæruleum*, is a half-hardy biennial, which requires to be raised on a hotbed, kept in a frame during winter, and planted out in spring, where it is to flower, in rich mould.

Trachyme'ne'. —*Umbelliferæ.*— Australian shrubs requiring a greenhouse. For the beautiful annual species, *T. cærùlea*, see Didiscus.

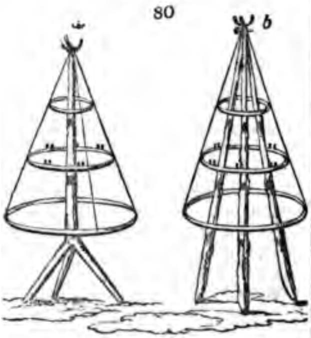
Tradesca'ntia.— *Commelineæ.*— Spiderwort. Handsome herbaceous plants, the common kinds of which only require planting in the open ground, and in any common garden soil. There are, however, several hothouse plants belonging to the genus, and two or three Mexican or South American annuals, which all require a light soil, enriched with rotten dung or vegetable-mould.

Tragopo'gon. — *Compositæ.* — Goat's Beard. Ornamental biennial plants, natives of Europe, which only require to receive the common treatment of similar plants, and to be grown in any garden soil. Of the British species, the most remarkable are *T. pratensis*, the popular name of which is Go-to-bed-at-noon, from the flowers closing in the middle of the day, and which has large yellow flowers, and a very curious feathery head of seeds; and *T. porrifolius*, the common Salsafy, which has purple flowers, and the roots of which are occasionally dressed as a vegetable.

Tragopy'rum. — *Polygoneæ.* — Goat's Wheat. Ornamental shrubby plants, with pink flowers, natives of Europe and America, which should be grown in very sandy loam, or heath-mould.

Training is an important operation, whether it be applied to nailing trees against a wall, or to training herbaceous plants over an iron or wooden frame-work. Climbing Roses may be trained as pyramids by fixing a pole with three legs, or three poles, in the ground, and suspending hoops from them, as shown in *Fig.* 36, and this mode of training may be applied to various other plants. Plants in pots may be trained by fixing a number of sticks or pins of iron, with hooks attached (*a*) in the earth in the pot, and resting hoops on them, as shown in *Fig.* 37.

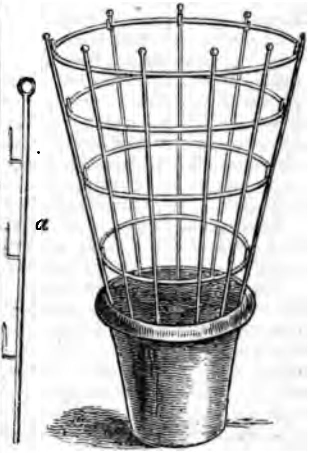
Fig. 36.



MODES OF TRAINING ROSES, &C. TO FORM PYRAMIDS.

Tra'pa.—*Hydrocharideæ.*—Water Caltrops. Aquatic plants, natives of Europe and the East Indies, with white flowers, and very curious nuts, which, when cooked, resemble in taste those of the chestnut, and are equally wholesome. The rhizoma should be planted, or the seeds sown, in loamy soil at the bottom of the water in which the plant is to grow.

Fig. 37.



MODE OF TRAINING PLANTS IN POTS.

Traveller's Joy.—See Clematis.

Tree Carnation.—*Diánthus arbóreus* is in its wild state probably only the common Carnation which has been trained against a wall, and, by being kept continually growing, has been forced to take the character of a tree. It should be planted in calcareous loam, against an east or west wall, and carefully trained, giving it a little protection in case of severe frosts.

Tree Mallow.—*Lavatera.*—Besides the common annual species of Lavatera, there are nine or ten species which are shrubby, and one of which, *L. phœnicea*, a native of the Canary Isles, is a tree 10 feet high. *L. maritima* is the commonest kind; and as this is a native of Spain and the South of France, it will thrive in the open air in England, if slightly protected during severe frosts. *L. triloba*, *L. subovata*, and *L. africana*, have all the same degree of hardiness, and they will all live and flower in British gardens, if about the same care be bestowed on them as is usually given to the tree Peony. *L. Olbia*, with reddish flowers — *L. Pseudo-Olbia*, with pale purple flowers — *L. unguiculata*, and *L. hispida*, are all shrubby species, which require a greenhouse, and should be grown in loam and peat.

TREFOIL.—See TRIFOLIUM.

TREME'LLA.—*Cryptogamia Fungi.* —A kind of lichen found on dead wood, the surface of which is powdery.

TREVIRA'NA.—*Scrophularineæ.*— There is only one species, *T. coccínea*, and this is perhaps better known as *Cyrílla pulchella*. It is a dwarf shrub with bright scarlet flowers, which it produces in September; and it should be kept either in a stove or in a warm greenhouse, the heat of which is between 60 and 70 degrees. It should be grown in a compost formed of equal parts of loam, peat, and sand, enriched with rotten cow-dung or vegetable mould, and it should be well and frequently syringed with warm water, to keep it clear of insects. When it is much infested with them, it will be advisable to heat the water to 120 degrees. It is propagated by dividing the roots in February, taking care not to bruise them; or by cuttings of the points of the shoots taken off in August; and in both cases the plants are much improved by frequently shifting them as the pots fill with roots, and always into pots only a little larger than those in which the plants were growing. Thus treated, the plants will become compact little bushes, and will flower abundantly.

TRICHOME'NA.—*Irideæ.*—Bulbous lants, with fine hair-like stems, requiring the usual treatment of Cape bulbs. See IXIA.

TRICOSANTHUS. — *Cucurbitaceæ.* —See SNAKE GOURD.

TRIFOLIUM.—*Leguminosæ.*—The clover, or Trefoil. Those who are accustomed to consider the trefoil as only the common clover of the meadows, will probably be surprised to find that there are nearly a hundred and fifty species, all more or less ornamental. Some of these are perennials and some annuals; and the colour of their flowers varies from dark crimson, and sometimes scarlet, to purple on the one hand, and to white, cream-colour, and pale yellow on the other.

TRI'LLIUM.—*Melanthaceæ.*—Tuberous-rooted plants, generally with dark brown or reddish flowers, which have a remarkably rich and velvet-like appearance. They are all natives of North America, and they should all be grown in shady places, in sandy peat kept moist. Thus treated they will flower freely, and their flowers will have a very rich and singular effect.

TRIPTI'LLON.—*Compositæ.*—Chilian annuals, which are hardy in Britain, and worth growing for their curious feathery seeds.

TRISTA'NIA.— *Myrtaceæ.*— Australian shrubs, nearly allied to Melaleuca; which require a greenhouse in England. They should be grown in sandy peat, and they are propagated by cuttings.

TRITO'NIA. — *Irideæ.* — Bulbous plants with splendid flowers, which will thrive in the open ground for many years without taking up, if grown in a dry sandy soil, or protected from rain during winter. See IXIA.

TRO'LLIUS. — *Ranunculaceæ.* — The Globe flower, is a British plant frequently grown in gardens, but on which cultivation appears to have had no effect. There are some exotic species.

Tropæ'olum.— *Tropæolaceæ.* — The Garden Nasturtium. The well-known annual plants called the Nasturtium are common in every garden, and only require sowing with the other hardy annuals in spring; they may be suffered to sow themselves in autumn. There were formerly only two kinds of the annual Tropæolums, *T. major* and *T. minor;* but since 1830, several varieties have been raised. One with very dark flowers, is called *T. m. atrosanguineum*, and another with dark stripes is *T. m. venústum.* The young shoots of these plants are succulent, and taste like the common land cress, the botanical name of which is Nasturtium, and hence they have received their popular name. Besides the hardy annual kinds, there are several half-hardy species, most of which are kept in the greenhouse. The best known in these is *Tropæolum tricolòrum*, with red, black, and yellow flowers, which has tuberous roots, and such very weak and slender stems, that it is found necessary always to train them over a wire frame, as they are quite unable to support themselves. In Paxton's Magazine of Botany it is stated, that the tuber of the root should not be buried, but only placed on the surface of the soil, so that the fibrous roots may penetrate it. This, he says, will enlarge the bulb or tuber in "a truly astonishing manner," and though the plants will not appear healthy the first season, they will afterwards become extremely vigorous. He also recommends using double pots for these plants, and filling up the interstices with river sand, which should always be kept moist. *T. brachyceras* may be treated in the same manner; and it would probably succeed with *T. tuberosum*, a species which it is very difficult to throw into flower under ordinary treatment; but which grows best in the open ground, in rich soil, and with plenty of air and light. *T. peregrinum*, the Canary Bird flower, was formerly considered a greenhouse plant, but it is now found much better to treat it as a half-hardy annual, raising the seeds on a hot-bed and planting them out in May, near some trellis work, or other support, which the plant will soon cover in the most graceful manner, producing thousands of its elegant fringe-like pale yellow flowers. For the culture of *Tropæolum pentaphyllum*, see Chymocarpus.

True Service.—*Py'rus Sórbus*, or *Sórbus doméstica.*

Trumpet Flower.—See Bign'onia and Tecoma.

Tuber.—Tubers closely resemble in their nature what are called solid bulbs or corms, and appear to be reservoirs of nourishment which have been laid up by nature for the support of the infant plant. Some tubers have numerous buds in different parts of their substance, like the potato, and others have only buds in the upper part like the Dahlia, and Ranunculus.

Tuberose.—See Polianthes.

Tulip.—See Tulipa.

Tu'lipa.—*Tulipaceæ.*—The Tulip. The greater part of the Tulips grown in gardens are varieties of one species, *Tùlipa Gesnerìana*, a native of the Levant; but there are several other distinct species. One of the most beautiful of these is the wild French Tulip, *T. sylvéstris*, which is most elegantly shaped, of a beautiful yellow, and very fragrant, and which is occasionally found wild in England. *T. óculus sòlis* is an Italian species, and *T. præcox*, Van Thol's Tulip, is a dwarf plant that flowers very early in the season, generally in March or April. B these there are twelve other species, quite distinct. The garden varieties of *T. Gesneriana* are divided into four classes, the first containing the Bizarres, which have a yellow ground shaded with dark-brownish red or purple, and which are subdivided into the flaked, in which the dark colour is in a broad stripe or band, rising from the bottom of the petal; and the feathered, in which the dark colour forms a marginal edging to the petals, descending into them in various little delicate feathery veins. The second class contains the Byblœmens, which are white shaded with violet or dark purple, and which are also subdivided into flaked and feathered. The third class are called Roses, and they have white grounds shaded with Rose colour or Cherry red, and they also are divided into flaked and feathered; and the fourth class are the selfs, which are white or yellow without any dark colour. Besides these there are what are called breeders, which are of a dingy crimson, and which are seedling Tulips before they have shown any variety of colour; parrot Tulips, which are supposed to be a variety of *T. sylvestris;* and double Tulips, which are not valued by florists at all. All seedling Tulips when they first flower, are what are called breeders, and of a dull uniform colour; and to make them break, that is to produce the brilliant and distinct colours which constitute the beauty of a florist's flower, a variety of expedients are resorted to. At one time they are grown in poor soil and only allowed water enough to keep them living; and then they are suddenly transported to the richest soil, abounding in food and moisture; and sometimes they are sent into the country, twenty or thirty miles from the place where they were grown, to try the effect of change of air. Seedling Tulips are generally five years before they flower. In addition to the kinds already enumerated, the French have what they call Baguettes, which are very tall-stemmed Tulips, the flowers of which are white, striped with dark-brownish red; Baguettes Rigauds, which resemble the others, but have shorter stems and larger flowers; and Flamands, which have a white ground and broad dark red stripes. The Dutch have also a kind which they call the Incomparable Verport, which is white, feathered with bright shining brown. All florist's Tulips ought to have cup-shaped flowers, round at the base; the ground colour inside the flower ought to be quite clear and bright in the centre; and all the marks ought to appear sharply cut and distinct.

The culture of the Tulip as a florist's flower, requires constant attention. A bed about four feet wide, and of any convenient length, should be dug out to the depth of two feet, and a stratum of fresh turfy loam should be laid, and on this there should be a layer of rotten cowdung, and on that a layer of loam mixed with an equal quantity of sand. The surface of the bed should be slightly raised in the middle, and the tallest Tulips should be planted along it; the lower-growing ones being ranged on each side, so as to make the flowers form a gentle curve to the sides of the bed. The Tulips should be seven inches apart every way; and should be planted two or three inches deep; and the bed should be protected by half-hoops placed over it at regular distances, over which mats should be strained; the covering being so contrived as to be removed or opened at pleasure. When the Tulips are nearly arrived at their full height, the hoops and mats should be removed, and a path being made round the bed, a canvas awning, supported on a wooden frame, should be substituted. When the plants have done flowering, the leaves should be suffered to remain on till they turn brown, in order that they may assist in perfecting the new bulb, which is formed every year in lieu of the old one, which gradually wastes away. When the leaves are withered, the bulbs are taken up and laid on shelves to dry; after which the leaves, if any remain on, are removed, and the fibrous roots, which will have withered up, are rubbed off and the bulbs are put into a box, divided into compartments, so as to keep the named sorts apart till the season for replanting, which is the last week in October or the first in November. A fresh bed should be made for Tulips every year, or the soil of the old bed should be changed; as the exudations from Tulips poison the ground for other plants of the same kind, though they are suitable for other crops. The usual rotation in Holland is, Tulips, Polyanthus-narcissus, Crocuses, and Hyacinths. Mr. Groom, of Walworth, is the principal Tulip-grower in the neighbourhood of London; and he has an exhibition of them every year in May.

Tulip-tree.—See Liriodendron.

Tuna. — One of the kinds of Prickly Pear or Indian Fig. — See Opuntia.

Tupa.—*Lobeliaceæ.* — The new name for the large upright-growing kinds of Lobelia, with scarlet flowers.

Tupelo-tree.—*Nyssa sylvatica.*

Turmeric.—*Curcuma.*—Scitamineous plants with very showy flowers, natives of the East Indies, which require a stove in England. They should be grown in light rich earth, and they are propagated by offsets.

Turne'ra.—*Turneriaceæ.*—Stove shrubs and herbaceous plants with yellow flowers, some of which bear a slight resemblance to those of the Thunbergia. They should be grown in light rich soil, and they are propagated by cuttings, or by seeds, which they ripen freely.

Turpentine-tree.—*Pistàcia terebínthus.*—It must be observed, however, that common Turpentine is procured from the different trees of the Pine and Fir tribe.

Tussilago. — *Compositæ.* — The Coltsfoot or Butter bur. Some of the species are pretty and worth cultivating, particularly *T. fragrans.* They will all grow in a garden soil; and are very troublesome to keep in bounds from the immense number of suckers that they send up from their roots.

Tutsan.—See Androsæmum and Hypericum.

Typha. — *Typhineæ.* — Catstail Rush. Aquatic plants, suitable for growing on the borders of ponds, and made pieces of water, to hide the boundary.

U.

Ulex. — *Leguminosæ.* — The Furze. An erect evergreen shrub with yellow flowers, which are produced nearly all the year. The double-blossomed Furze is very handsome, and makes a beautiful hedge. When it is employed for this purpose, a bank of earth should be raised three or four feet high, and wider at the bottom than at the top, and the cuttings should be planted in a drill along the ridge. The soil should be somewhat sandy, and if there be plenty of room the plants should be left to nature to hang down loosely over the bank, and they should never be pruned except to cut out the dead wood. *U. nana* grows generally on very poor gravelly soils, and seldom exceeds two feet in height; while *U.*

europæa, the common kind, in favourable situations will grow ten feet high. *U. stricta*, the Irish Furze, has no spines, and it grows straight upright to the height of eight feet or ten feet. It requires a moist rich soil; and it is propagated by cuttings like the double-blossomed kind, as it has never yet been known to ripen seeds. All the other kinds are propagated by seeds, which they ripen in great abundance.

Ulmus.—*Ulmaceæ.*— The Elm. The weeping Elm is a very ornamental tree for pleasure-grounds.

Umbili'cus.—*Crassulaceæ.*—The new name for some of the kinds of Navelwort.—See Cotyledon.

Umbrella Tree.—*Magnòlia tripétala.*—See Magnolia.

Ure'do.—*Cryptogamia.*—A kind of rust often found on the leaves of Rose Trees and other plants.—See Mildew.

Urti'ca. — *Urticàceæ.* — The Nettle. The Roman Nettle, *U. pilulifera*, is sometimes grown in gardens as an ornamental annual, but the sting is much worse than that of *U. dioica*, the common Nettle. Some of the exotic species are very handsome; as for example, *U. reticulata*, a native of Jamaica, which has red and yellow flowers and deep green leaves. All the Nettles thrive most in a deep rich soil.

Us'nea.—*Cryptogamia.*—A kind of lichen that hangs down like a beard from the branches of old trees, particularly Oaks, and has a very picturesque appearance.

Uvula'ria.—*Melenthaceæ.*— Perennial hardy plants with pale yellow flowers, natives of North America, which should be grown in a compost of peat and loam; a pit about a foot square every way, being dug in the open border and filled with the compost to plant them in. If the subsoil be not good, the pit may be made a little deeper, and a layer of stones and brickbats may he put in the bottom. The plants are propagated by suckers, which they produce in great abundance.

V.

Vacci'nium. — *Ericaceæ.* — The Whortle Berry. Dwarf shrubs with pretty drooping heath-like flowers, and generally showy fruit; found generally wild on commons in Europe and North America. *V. myrtillus*, the common Bilberry, is the commonest species in England, and there is a variety with white berries in Germany. The Cranberry, *V. oxycóccus*, Lin., is now called *Oxycóccus palustris.*

Valerian.—See Valeriana.

Valeria'na.—*Valerianeæ.* — Perennial plants, mostly natives of Europe, which will grow in any common soil. The dwarf species are very suitable for rockwork.

Vallisne'ria.--*Hydrocharideæ.*-- Water-plants, which succeed best in a greenhouse, and which should be planted in a layer of loam at the bottom of the cistern in which they are to be grown. The male and female flowers are on different plants; and the latter rise on long spiral stalks, which gradually uncoil above the surface of the water, while the latter are produced at the bottom. Before, however, the anthers burst to discharge the pollen, the male flowers detach themselves from their stalks and rise up to the surface, on which they float like little white bubbles. After the pollen has been distributed over the stigmas, the male flowers wither, and the spiral stalks of the females coil up again so as to draw the seed-vessel under the water, that it may ripen at the bottom and burst when just in the proper place to deposit its seeds. Nothing can be more beautiful than the whole arrangement; and nothing can show more strikingly the admirable manner in which the economy of nature is carried on.

Valonia Oak.—*Quercus Ægilops.* —The acorns are enveloped in a curious leafy cup; and the tree, which is generally of small size, is very handsome.—See Quercus.

Va'nda.—*Orchidaceæ.*—A beautiful epiphyte, which is made the type of a section from the great number that are nearly allied to it. It should be grown on the branch of a tree.—See Orchideous Epiphytes.

Van'illa. — *Orchidaceæ.* — A creeping parasite, common in tropical climates, which throws out roots at every joint that penetrate into the bark of the trees on which the plant grows. When grown in an orchideous house, these plants are frequently fixed in a crevice in the damp wall, whence they spread out in different directions, catching hold of every object within their reach. When thus treated and kept in a strong moist heat, the plants will flower; but unless objects are near for their roots to attach themselves to, the plants will never be strong and healthy. The native Vanilla is used for putting into chocolate.

Vascula'res are plants, the leaves and stems of which contain spiral vessels; in opposition to Cellulares or plants which are composed only of cellular tissue. All the flowering plants belong to the Vasculares; but the mosses, fungi, and lichens, are Cellulares.

Vases in pleasure-grounds have often a very good effect, particularly on the terrace of an Italian villa. Wherever they are introduced, however, they should always stand on a plinth, broader than the circular base; as nothing can have a more unartistical effect than to see a vase resting on the bare ground.

Ve'lla. — *Cruciferæ.* — The shrubby Cressrocket. *V. pseudocytisus* is one of the few Cruciferous shrubs. It is evergreen, and only grows two feet or three feet high, with glaucous leaves and bright yellow flowers, which appear in April and May. It is a native of Spain, and it was formerly considered a greenhouse plant in England, but it is now found to be hardy. It grows best in calcareous loam, but it will thrive in any garden soil; and it is very suitable for rockwork. It is propagated by cuttings of the young wood planted in sand under a glass.

Velonia.—See Velonia.

Venus's Comb.—*Scándix pécten.* —A British weed.

Venus's Fly-trap.—See Dionæ'a.

Venus's Looking-glass.—See Campanula.

Verba'scum.—*Solanaceæ.* — The Mullein or Flannel plant. Showy herbaceous plants, generally with yellow flowers, and most of which are natives of Britain. The greater number of the species are biennials, and require the usual treatment of such plants (see Biennials); but *V. phœniceum*, one of the handsomest species, is a perennial. They will all grow in any common garden soil, though they prefer one which is somewhat loamy; and they are increased by seeds or by dividing the root.

Verbe'na.—*Verbenaceæ.* — Only a few years ago the Verbenas were scarcely known in flower-gardens, except by *V. Aublètia*, with pinkish flowers, and *V. Lambérti*, with purple ones, neither of which possessed much beauty. In 1827, the beautiful *Verbena Melíndres*, or as it is sometimes called, *V. chamædrifòlia*, was introduced from Buenos Ayres, and it directly became a favourite, though for some years it was kept carefully in the greenhouse, and considered difficult to manage. Since that time, however, numerous other species have been introduced, and as they are found to hybridize freely, innumerable hybrids and varieties have been raised. They are all found to root freely from layers, and to strike as freely from cuttings, and to thrive during summer in the open air. They have thus become general everywhere; and it is now rare to see a garden or a balcony without them. The kinds principally cultivated are the following: *V. Melindres*, the common scarlet Verbena, the colour of which is the most brilliant scarlet. It is, however, the most tender kind of Verbena, and when planted in the open air it is generally killed by the first frost if not protected. It is a prostrate plant, and should be pegged down over the bed it is intended to cover, when it will throw out roots at every joint. Its varieties, *V. M. latifolia*, and *V. M. splendens*, which are probably hybrids between *V. Melindres* and *V. Tweediana*, are much more hardy than the species, and they are naturally more upright-growing, though when pegged down they throw out roots at every joint in the same manner. *V. Tweediana* is an upright-growing plant with crimson flowers, and it is very hardy; *V. incisa* is also hardy and upright-growing, but its flowers are of a pale pink and have a faded look. *V. Arraniana* has an upright habit of growth and purplish crimson flowers; but it is very tender, and very apt to be attacked by aphides. *V. Aubletia* and *V. Lamberti* are prostrate species and very hardy; *V. Sabinii*, another prostrate species, has lilac flowers, and it has a variety with white ones. *V. pulchélla* is also prostrate, and so is *V. sulphurea*, the flowers of which are yellow. *V. Neilii*, *V. teucroides*, and *V. venosa*, are upright-growing. The first has lilac flowers, the second white ones, and the last purple; the last two are of a very coarse habit of growth. The Lemon-scented plant, *Verbena triphýlla*, is now called *Aloysia citriodora*. (See Alovsia.) All the Verbenas will grow in any light soil, but they thrive best in sandy peat or heath-mould.

Vero'nica. — *Scrophularineæ.* — Speedwell. Very pretty perennial and annual plants, generally with blue flowers, natives of Europe, and many of them found wild in Britain. They are all of the easiest culture, as they will grow well in any common garden-soil that is tolerably light, and at the same time moist; and they are propagated by seeds and division of the root. Many of the kinds are very suitable for rockwork.

Vervain.—See Verbena.

Vesica'ria.—*Cruciferæ.*—Herbaceous plants, mostly with yellow flowers, natives of Europe and America, that should be grown in sandy loam, and which are propagated by seeds or division of the root.

Vetch.—See Vicia.

Vibu'rnum. — *Caprifoliaceæ.* — The Viburnum. Ornamental shrubs, generally with terminal corymbs of white flowers. One of the best known of these, the Laurestinus, *V. Tinus*, is an evergreen bush, with white flowers that are rose-coloured in the bud, and dark-blue berries, which is very valuable in town-gardens, as it flowers from December till March. It is a native of the south of Europe and the north of Africa. There is a variety with shining leaves and larger cymes of flowers, but it is rather more tender than the common kind. When the Laurestinus is grown near a dwelling-house, care should be taken in spring, when the leaves drop, to have them swept away every day, as they have an extremely disagreeable smell when they are decaying, and are said to be very unwholesome. The tree Viburnum (*V. Làntago*) is a native of North America, and it forms a very hardy and handsome low tree in British gardens. It is also valuable for the great abundance of its berries, which are a favourite food with birds. The Wayfaring Tree, or Wild Guelder Rose (*V. Lantàna*), is another interesting small tree; and *V. cotinifòlium* is a beautiful species from Nepaul. The most interesting kind of Viburnum grown in small gardens is, however, the Guelder Rose, or Snowball Tree, *V. Opulus*. This is a deciduous shrub, a native of Europe and part of Asia, which is always found in a wild state in swampy thickets. In a wild state its principal beauty lies in its bright red berries; but in a state of cultivation its heads of flowers become so compact, of such a snowy whiteness, as amply to justify its popular name of the Snowball Tree. All the Viburnums are hardy in British gardens; and they will all grow freely in any common soil. They are generally propagated by layers, but cuttings will strike freely if kept moist, and in a shady situation. When transplanted the evergreen species should be removed in October or November, as they have few fibrous roots, and are very apt to be killed by a continuance of dry weather if they are transplanted in spring.

VI'CIA.--*Leguminosæ*.--The Vetch. The ornamental species are generally pretty climbing plants, with purplish flowers, natives of Europe. Some of the kinds, however, have white, some pink, others blue, and others pale yellow flowers. All the kinds grow freely in any garden soil, though they *thrive most* when the soil is deep and sandy; and they are propagated by seeds or divisions of the roots.

VIEUSSEU'XIA. — *Irideæ*. — The Peacock Iris. These beautiful flowers are better known under their old names of *Iris Pavonia* and *Moræ'a*, than under their present almost unpronounceable appellation. They are very nearly hardy, and may be grown in the open border, if treated as directed for IXIA (p. 155); but as the bulbs are very small and delicate, it is, perhaps, safer to grow them in pots, in equal parts of peat, vegetable-mould, and sand, and to keep them dry, or take them out of the pots when they have done flowering till the planting or growing season returns the following year.

VI'NCA.—*Apocyneæ*.—The Periwinkle. There are two species common in British gardens, both of which are creeping or trailing evergreen shrubs, which will grow freely under the shade of trees. They both prefer a soft, moist soil, which they can easily penetrate with their long creeping roots. *V. major* is the common species, and *V. minor* only differs in the flowers being smaller, and the whole plant more delicate. The Periwinkle is generally propagated by its runners, which strike root from every joint, like those of the strawberry, and which only want dividing from the parent to become plants. When it is wished to make the Periwinkle produce seeds, the plant should be grown in a pot, and all the lateral shoots cut off.

VINE.—The common Vine (*Vitis vinifera*) may often be introduced with very good effect in ornamental garden scenery, for covering a bower or verandah, or training round the window of a breakfast room. Nothing can, indeed, be more beautiful than a vine in the last-mentioned situation, forming a framework, as it were, to the garden beyond; and with its beautiful leaves looking almost transparent in the morning sun. A Vine also looks very well when suffered to grow naturally among the tall trees of a lawn or shrubbery, as it hangs itself from branch to branch in a manner more graceful than any art can hope to imitate. A Vine thus treated would have a very good effect in the grounds of an Italian villa. The three American species, *V. labrúsca*, or the Wild Vine, *V. vulpìna*, or the Fox Grape, and *V. ripària*, or the Sweet-scented Vine, the flowers of which smell like Mignionette, are all very suitable for growing in the open air, from their extreme hardiness. All Vines like a very rich and somewhat moist soil, and thrive best when their roots can get access to a drain, sewer, or muddy pond.

Vı̀ola.—*Violaceæ.* — Beautiful perennial dwarf plants, natives of Europe and North America, and growing generally in moist shady banks in woods. There are nearly 150 kinds grown in British gardens, but the most common are *V. odoràta* (see Violet), and *V. trícolor* (see Heart's-ease). The shrubby or Tree Violet (*V. palmaénsis*), a native of one of the Canary Isles, is a very handsome plant, growing about two feet high, with a shrubby stem, and large purplish-blue flowers; it is usually kept in a greenhouse in England, where it flowers from May to July. The Fan-leaved Violet (*V. flabellàta*), and the Hollow-leaved Violet (*V. cucullàta*), are both American species, with large and handsome flowers. All the species should be grown in peat and loam kept moist, and they all thrive best in a shady situation.

Violet. — The common sweet-scented Violet (*V. odoràta*) is a British plant which grows in woods or on and under banks. The white Violets are found generally in calcareous soils; and the sweetest I ever smelt, were, I think, those I have gathered growing among the limestone rocks in the woods of Dudley Castle. In garden culture, however, what are called the Neapolitan and Russian Violets are the most useful, as they flower during the winter months; and of these the Neapolitan are the sweetest. These delightful Violets, which flower from October to April or May, should be grown in pots or boxes, where they can be covered with a hand-glass, in case of severe frost. They should be propagated by cuttings taken off in May, and struck in sand under a glass; when the young plants have taken root they should be transplanted into other pots filled with light rich soil; and finally, in August, they should be removed to the pots or boxes in which they are to flower. These pots or boxes should be well drained by having a layer of potsherds at the bottom of considerable thickness; and they should be filled up with a compost made of two-fourths of vegetable-mould, one of loam, and one of silver-sand. They should be covered with a hand-glass during heavy rains, or in frosty weather; and if the frost is very severe a mat should be put over the glass. When the pots or boxes are introduced into a sitting-room, they should be watered twice a day, but once will be sufficient if the plants are grown in the open air. It must be observed that plants in a sitting-room, where a constant fire is kept, are generally in an equal degree of heat to a hot-house at 65°; only the air of the living-room is much drier than that of the stove, and to counteract this, additional watering is required. The common Violets only require planting on a sloping bank in a shady place, in a peaty soil, where they will have moisture, but where their roots will not be exposed to the effects of stagnant water.

Viper's Bugloss—See **Echium.**

Viper's Grass—See **Scorzonera.**

Virgi'lia—*Leguminosa.* A very handsome low tree, a native of North America, with drooping racemes of white flowers, resembling in form those of the laburnum. It grows freely in any sandy soil.

Virginian Creeper—See **Ampelopsis.**

Virginian Poke — See **Phylolacca.**

Virgin's Bower—See **Clematis.**

Vi'scum — *Loranthaceæ.* — The Misletoe. This curious parasite can hardly be called ornamental, though it may be sometimes introduced with effect, to give an air of antiquity to newly planted pleasure-grounds. It grows best on old cankered apple-trees, but it may be made to take root on even a young tree, by slightly wounding the bark and inserting a ripe seed. It must be observed, however, that as the male and female flowers of the misletoe are on separate plants, the berries are not always fertile. It is a vulgar error to suppose that the misletoe grows generally on the oak, as it is extremely rare on that tree in England; it is found most commonly on the apple, and next on the hawthorn; it is also found on the lime, the sycamore, the willow, the poplar, and the ash, occasionally on the cherry, and sometimes, though rarely, on pines and firs. When the seeds begin to grow, they send out first one or two roots, which ascend for a short time, and then turn back to the bark, on which they fix themselves, like the sucker of an insect. The other end afterwards detaches itself from the tree, and becomes leaves and shoots. The roots of the misletoe descend between the bark and the young wood, and no intimate union takes place between the old wood of the parasite and its supporter. This is plainly shown in a piece of an old thorn, given to me by H. Long, Esq., of Farnham Lodge, to which a misletoe of very large dimensions was attached. The wood of the misletoe is of a very fine pale yellowish tinge, and it is as hard and of as fine a grain as box, which it greatly resembles, while that of the thorn is dark brown.

Vi'tex—*Verbenaceæ.* The chaste tree. The principal species are *V. Agnus-castus*, which is a dwarf shrub, with whitish flowers, which will grow in any common soil, and will generally stand out in British gardens, though it is sometimes killed by a severe winter; and *V. incisa*, which has pretty palmate leaves and purple flowers, but it is so long before it puts out its leaves in spring, and looks so much as though it were dead before its leaves expand, that it is often thrown aside as worthless, when it is in perfect vigour; it is generally kept in a greenhouse, and grows in peat and loam. Besides these, there are several hothouse species, natives of the East Indies, which are not worth cultivating.

Vi'tis—*Ampelideæ*—See **Vine.**

Volkame'ria — *Verbenaceæ.* — Nearly all the plants formerly included in this genus have been removed to **Clerodendrum**; and it now contains only two species; one a stove shrub with white flowers, from the West Indies; and the other a half-hardy tree with purple flowers from Nepaul.

W.

Wachendo'rfia — *Hæmodoraceæ.* — Bulbous and tuberous-rooted plants with large panicles of very showy flowers, which are generally yellow. These plants have rhizomas or under-ground stems, in the scales of which, in some of the species, little bulbs form, which, if removed and planted, become distinct plants. These are the bulbous kinds. The others have the same kind of rhizoma or fleshy under-ground stem, but no bulbs form in it. All the kinds are nearly hardy; and they will thrive in the open ground, provided the situation be tolerably dry, without its being necessary to take up their roots during winter.

Wahlenbe'rgia—*Campanulaceæ.* Perennial and annual plants, formerly considered as belonging to Campanula, and of which *Campánula grandiflòra* is the type. They should all be grown in sandy loam, and they are propagated by seeds, and division of the roots.

Walks may be considered with reference to their direction, their construction, and their management. In a small garden, the direction of the main walks should generally be governed by the boundary lines; and hence, in a plot of ground which is square or oblong, the walks should be straight and rectangular: the object, in such a case, being to produce the beauties of regularity and symmetry. On the other hand, when the boundaries of a garden are irregular, the surrounding walk may be irregular also; the object in this irregularity being to create variety by contrast in the direction. When a garden bounded by straight lines, is so large as to contain an acre or two, and the whole of the interior is to be laid out as pleasure-ground, then the walks may be varied in direction; the boundary being concealed by trees and shrubs, or by artificial undulations of the soil. In general, it may be laid down as a principle, that all walks should be straight when there is no obvious reason why they should be otherwise; and hence, in the case of all winding walks, if there is not a natural and apparently unavoidable reason for their deviating from the straight line, an artificial reason ought to be created. This may always be done even on a flat surface by the position of trees and shrubs, or when there is the slightest inclination to inequality of surface, the same sufficient reason may be created by heightening these inequalities. When a winding walk bends to the right, the trees and shrubs ought to be chiefly conspicuous on the left side, and the contrary; and the same rule is applicable to the natural or artificial inequalities. When a walk is made perfectly straight, the surface of the ground ought to be perfectly even for some feet in width on each side of the walk, excepting in some few cases, such as a straight terrace walk along a regular uniform slope, in which case the ground on one side of the walk will rise regularly, and on the other side will fall regularly. All straight walks should lead to some conspicuous object at the farther end of the walk, and facing it, so as to appear to belong to it; and this object should be seen the moment the walk is entered upon. Hence, every straight walk should have an object at each end, such as a seat, an alcove, an archway, a gate, a door, a statue, a fountain, &c. A winding walk, on the contrary, requires no object at the farther end to allure the spectator; because every turn has the effect of an object by exciting his curiosity and inducing him to advance to see what is beyond. Where one walk abuts upon or joins another at a nearly right angle, it becomes subject to the same laws as a straight walk, and opposite to the abutting point or place of junction there ought to be a seat, a statue, or some other object, partly to form a termination to the abutting or joining walk, and partly to serve as an obvious reason why the one walk joins to the other at that point rather than elsewhere. At the same time, other reasons for the junction at that point may exist or may be created; for example, the surface of the ground may be favourable, or trees and shrubs may be planted so as to render it apparently impossible to join anywhere else. It has been said, that in laying out winding walks, nature should be imitated, and the tracks of sheep in pastures, or of wild animals on commons have been held up as examples:—

———" The milkmaid's careless step
Has, thro' yon pasture green, from stile to stile,
Imprest a kindred curve; the scudding hare
Draws to her dew-sprent seat, o'er thymy heaths,
A path as gently waving."———

But to imitate such walks would be to copy vulgar nature ;, and therefore art refines on these lines by rendering them more definite and elegant. In short, by exhibiting in them a choice of form or line for its own sake; because of the various lines or parts of lines found in accidental footpaths, or in the tracks of hares, some must be more agreeable to the eye than others, and it is only these agreeable parts which are to be imitated, and combined in garden scenery. All this is founded on the recognition of a principle, which is, or ought to be, the foundation of all the fine arts; viz., that nature is to be imitated, not to be copied. To copy nature exactly as she appears before us is the province of common art, and may be pleasing to many minds; but to minds of culture and refinement, nature requires to be copied in such a manner or in such a medium as to show art. If this were not the case, and if we were to copy foot-paths exactly, then we should, of course, not gravel them, or define them by regular edges. Hence, when one walk joins another, the angles of junction should never be rounded off in that extreme degree which is found in public roads; where in turning out of one path into another, an obtuse or rounded angle seldom fails to be found. The appearance of such an angle in garden scenery, whether in carriage-roads or foot-walks, destroys all allusion to high art; and hence, in all gardens containing winding walks which are much frequented, the junctions of these walks with others should be protected by trees and shrubs, or by vases or other architectural objects, in such a manner as to render this rounding of the angles of junction impossible.

The construction of walks, more especially on soils which are not naturally dry, and on surfaces which are not level or nearly so, requires considerable skill. The inclination of the walk from one point to another should be so arranged as to carry off the surface water from rain or melting snows along the edges of the walks, and the underground water by drains beneath the surface. In even surfaces, even though not level, this is attended with little difficulty; and one drain under the centre of the walk, or on one side of it, will suffice, for a considerable length, without any branch drains to carry off the water which accumulates; but where the surface rises and falls alternately, it is not only necessary to have a drain under the walk throughout its whole length, but a branch drain to some natural outlet is essential at every change of surface. These drains are not only intended to carry off the underground water, but also that which collects on the surface, and finds its way to the sides; and for this purpose there are small cross drains formed at certain distances, which communicate from the sides to the centre, and these side drains communicate with the surface by a small upright tube or well, covered by an iron grating or by a flag-stone pierced with holes to admit the water. Sometimes the main drain, instead of being formed under the centre of the walk, is made at one side, and sometimes in the case of walks through a lawn the drain is made under the turf; but in this case, as in the other, the small cross-drains communicate with it, and are furnished with gratings on a level with the surface of the sides of the walk. In general, these gratings are placed close to the edge of the walk, more especially when it passes through dug ground edged with box, or where there is little ground to spare; but when it passes through a lawn, the gratings are best placed in small recesses in the turf at the sides. In the case of dry soils with a porous subsoil of gravel, sand, or rock, drains may be dispensed with altogether; and in those parts of the country where the kind of gravel used does not bind so as to form a sufficiently smooth and compact surface to prevent the water from sinking into it, the side gratings may be dispensed with. In walks on very uneven surfaces, such as where they are conducted up and down declivities, considerable care in the construction is required, in order to prevent the gravel from being washed away during heavy rains, or the thawing of snow. Two things are requisite for this purpose; very complete drainage, with gratings on both sides, not more than two or three yards apart; and having the surface of the walk raised much higher in the middle than usual, so as to throw the water immediately to the sides, and never to admit of a current in the direction of the walk. The next requisite is a much coarser gravel than usual, in consequence of which the water of rain or snow cannot wash away the sandy particles. The most effective mode, however, is to wash the gravel quite clean, so as to leave no particle smaller than a large gooseberry, or larger than a small apple, and to mix the whole with Roman cement. Were it not for the disagreeable dark colour of asphalte, walks on steep declivities laid with this material would be preferable to any others, as being by far the most durable.

In the operation of forming walks, the first step, after the line has been marked out, is to take the levels of the surface, so as to determine the degree of inclination necessary for carrying off the water, and also what quantity of soil will have to be removed on each side of the walk, so as to reduce the whole to a uniform surface. The next step is to mark out the width of the walk, after which the soil is to be excavated. The depth of the excavation will depend on the nature of the subsoil. If that is dry and absorbent, such as gravel or rock, then the depth need not be more than a foot or eighteen inches; but if the subsoil is retentive, such as clay or loam, then the depth, at least in the centre of the walk, should be between eighteen inches and two feet, and it should be at least one foot in depth at the sides. The drain may be made in the centre, that being the deepest part; and this being done, the excavation is to be filled up to within nine inches of the surface with small stones, broken brickbats, and such like materials, which are to be well beaten down with a rammer. On this surface a layer, three inches in thickness, of coarse gravel should be laid, and also well rammed down, and the remaining six inches should be filled in with the best gravel, which should not be rammed, but rolled after being raked to an even surface. If the walk is to be edged wth box, that should be planted immediately before laying on the three-inch stratum of coarse gravel; but if it is to be edged with turf, the most convenient time for laying it down is before putting on the upper stratum of six inches.—See Buxus and Edgings.

The management of walks consists in keeping them clean by the removal of all extraneous matters from their surface, including weeds; and in preventing worms from working in them, and throwing up casts. Leaves and other extraneous matters are removed by sweeping; but weeds must be hoed or pulled up, or destroyed by watering the walks with salt water, which will also effectually destroy the worms. Every time a walk is hoed, it ought to be raked and rolled; and to preserve the surface quite smooth and firm, it ought always to be rolled as soon after rainy weather as the surface has become quite dry. To renew the surface of walks, they may be turned over once a year in spring; but this is only advisable in the case of fine coloured gravels, such as that of Kensington, in order to present a fresh surface; for, with reference to the smoothness, firmness, and easy keeping of the walk, turning over the gravel is injurious rather than otherwise.—See Gravel.

Wall Cress.—See Arabis.

Wallflower.—Common as this flower is, it well deserves great pains to be taken in its cultivation; as its principal beauty is displayed at a season when there are few hardy plants in flower: the Crocuses, Hyacinths, and Narcissi, are just over, or beginning to decay, and the annuals have not yet begun to expand their blossoms. In April and May the brilliant yellow and dark orange of the Wallflowers give a peculiar brilliancy and liveliness to gardens, which without them would present a naked and dull appearance. The common Wallflower (*Cheiranthus Cheri*) is generally called a biennial, and it does not flower till the second year after sowing. It will, however, frequently live three or four years in favourable situations. There are ten or twelve varieties; some of a rich dark reddish brown, called the Bloody Wallflowers, and others of a light yellow, with nearly all the intermediate shades. The dark and double-flowered kinds should be grown in very rich soil, but not freshly manured. The remains of Celery trenches used the previous year, or part of the ground under an old hot-bed, will suit these flowers exceedingly well; taking care to mix a little sand with the soil, if it be at all loamy, in order to lighten it. As the varieties can never be depended upon for coming true from seed, the best way to preserve any that are very rich in colour, or very double, is to make cuttings of them in May. These cuttings should be from shoots of the current year, and they should be about three inches long. They should be cut off carefully, and the end should be cut smooth at a joint with a sharp knife. The leaves should then be cut off close to the stem, for about half the length of the cuttings; and they should be put into pots filled with sandy loam and vegetable mould, about four inches apart, and three in a pot. They should be sprinkled with water three times a-day till they have taken root, which will be known by their beginning to grow. In many cases, the cuttings are merely put into the open garden; choosing a shady place, and mixing a little sand with the mould, when the ground is dug over before planting them. *C. mutábilis* is a half-shrubby evergreen, with dark purple, yellow, and lilac flowers, and it requires a light rich soil. *C. alpìnus* is a dwarf plant, with small yellow flowers, and is well adapted for rockwork. The stocks which were formerly considered to belong to this genus, are now removed to ***Mathiola***. Both Stocks and Wallflowers are frequently called Gilliflowers, a corruption of July flowers, as the Stocks flower about that month.

Walls for gardens are either used as boundary fences, and at the same time for the purpose of training plants on, or they are erected in gardens for the latter purpose only. They may be formed of different materials according to those that are most abundant in any given locality; but the best of all walls for garden purposes are those which are built of brick. Stone walls are durable and good; but the stones being much larger than bricks, the joints between them are too far apart for the purpose of neat training. Mud or earth walls when properly built with a coping sufficient to throw off the rain on every side, are dry, warm, and very congenial to plants, but from the fragile nature of the mud, they are not well adapted for training on. These two last kind of walls should, therefore, be covered with wire or wooden trellis-work, to which the plants may be tied. Walls made of boards are very good where they are not required to be high; and where the boards are soaked with tar, or coated over with pitch, and placed on a footing of brickwork, stone, or oak-plank, they will last many years. *Shelters*, as substitutes for walls, are formed of panels of reeds covered with trellis-work; or sometimes in Russia with wicker-work, the interstices being caulked with moss; and both these kinds of substitutes for walls last a number of years when protected from perpendicular rains by copings which project at least a foot on every side, and when placed on footings which secure them from the damp of the soil. Walls have also been formed for training on, by inserting large slates or thin flag-stones, such as the Caithness pavement, either in the soil (in which case the walls are not above four or five feet in height), or in frames of timber or iron, in which case they may be of any height required. Such walls are always covered with trellis-work to which the trees or plants are attached. The most generally applicable kind of walls, however, and those which are by far the best for garden purposes, are, as before observed, those formed of brick. When the wall is not intended to be more than four or five feet in height, it need not exceed nine inches in thickness; and the thickness of fourteen inches will admit of ten feet in height; the wall in both cases being built without piers which are great impediments to good training. With piers the height with any given thickness may be increased one-fourth. In no case, however, ought garden-walls, or indeed division or fence-walls of any kind which have not a load to support perpendicularly, or a pressure to resist on one side, to be built with piers. The same object may always be obtained by building the walls hollow; each side being of the thickness of four inches, and the two sides being joined together by cross partitions of four-inch work. An excellent garden-wall may thus be raised to the height of twelve or fourteen feet, with the same quantity of bricks that would raise a nine-inch wall to that height, with the addition only of the bricks necessary to form cross partitions at every three or four feet. The width of the wall may either be fourteen or eighteen inches, the vacuity in the former case being five inches, and in the latter nine inches. Where it is desired to save the expense of a coping, the sides of the wall may be gradually contracted towards the top, so as to finish with a coping of bricks set on edge crosswise; but no wall intended for fruit-trees or for tender-flowering shrubs should ever be built without a protecting coping, because the rains run down the face of the wall and render it moist and cold at those seasons when dryness and heat are most wanting, viz., in spring, when the buds are bursting, and in autumn when the young wood is ripening. The same moisture, and its alternation with dryness, rots the mortar in the joints of the bricks, and greatly injures and disfigures the face of the wall. When, therefore, walls are built without projecting copings, the exterior joints ought invariably to be pointed with stucco, as in France and Italy, or with Roman cement. Walls of nine inches in thickness, and even four-inch walls, if built in a winding or zigzag direction, may be carried to a considerable height without either having piers or being built hollow; and such walls answer perfectly for the interior of gardens. Hollow walls of every description may also be built at less expense by placing the bricks on edge instead of being laid flat; and not only garden walls but those of cottages and farm-buildings may be constructed in this manner. Lengthened details on this subject will be found in Mr. Loudon's ENCYCLOPEDIA OF COTTAGE ARCHITECTURE, and in his SUBURBAN GARDENER.

For further particulars respecting the use of walls in ornamental gardens, see CONSERVATIVE WALL.

WARRATAH.--See TELO'PEA.--There is also a Warratah Camilla; so called because its bright crimson colour resembles that of the true Warratah plant or Telópea of Botany Bay.

WATER in gardening may be considered with reference to its use in vegetable culture, and to its effect in landscape. When water is too abundant in any soil, it is to be removed by surface or underground draining; and the rain, or thawing snow which produces water on the surface, is to be conveyed away by similar means. See WALKS. Water as an element of culture is next in importance to soil, for plants can no more subsist without the one than without the other. All plants in a highly artificial state even in a moist climate like that of Britain require water occasionally; for extraordinary excitement by means of soil, or manure, or artificial temperature, will be ineffective unless seconded by water. For all ordinary purposes, it is sufficient to pour the water on the surface of the ground, but if the operation of watering were carried to the full extent of which it is susceptible, it would be supplied subterraneously by underground drains as is sometimes done in fen lands, and not unfrequently in reclaimed bogs, both in Great Britain and Ireland. Where the soil of a garden is to be made the most of, there should be a substratum of gravel or small stones, with drains or small tunnels, or perforated tubes of earthenware at regular distances, communicating with a supply of water a few feet above the surface of the soil, by which water might be admitted at pleasure, so as to irrigate the whole of the understrata, and to supply moisture to the roots of the plants altogether independently of what they might receive either artificially or naturally from the surface. This would be of great advantage in dry soils, not only to crops of herbaceous vegetables, and to the plants of flower-gardens, but to fruit-trees, forest trees, and useful or ornamental shrubs. It would be more especially useful in the case of orchards to set the blossoms in spring, and to swell off the fruit in autumn. It would produce astonishing effects in the case of fruit-trees planted against walls, and on vines planted in prepared borders, and on peach-trees in a state of forcing. The only objection to this mode of applying water is the expense.

Water considered with reference to its quality, should be without the admixture of extraneous mineral substances, such as acids or alkalies; and it should be of the same temperature as the soil, or higher rather than lower. In order that it should be of the same temperature as the soil, it is necessary to expose it to the action of the atmosphere in ponds or basins before using, and even when taking the water from such ponds or basins, the surface stratum of the water ought always to be taken by dipping in the watering-pot in such a manner as that only the surface of the water should run into it. In the application of water to plants, the most general mode is to pour it at their roots; but in doing this it is not necessary that the water should touch the stems or the collar of the plant. On the contrary the stems of tender plants, and even the soil for an inch or two all round them, is better kept dry; because the moisture on the collar is apt to create decay. The fibres which absorb the moisture and convey it to the leaves of the plants, are always extended to some distance from the stem; and hence it follows that a plant may be moistened immediately round the stem without rendering it any service, but, on the contrary, incurring the risk of rotting it; while if watered at some distance from the stem, it may be nourished in reality, and yet have the appearance of being starved for want of moisture.

For certain kinds of plants, such as the Hydrangea and the Balsam, Coxcombs, Chrysanthemums, and others which are of vigorous growth, water may be mixed with manure; such as concentrated stable-dung, recent sheep's-dung, or any other description of animal manure which is soluble in water. For some plants, such as heaths and most of the hair-rooted shrubs and herbs, this liquid manure is found to be injurious; but for many others, applied when they are in a growing state, it is found greatly to increase their vigour.

Water as an element of landscape scenery, is exhibited in small gardens either in ponds or basins, of regular, geometrical, or architectural forms; or in ponds or small lakes of irregular forms in imitation of the shapes seen in natural landscape. In general all geometrical or architectural basins of water ought to have the margins of masonry, or at least of stones placed so as to imitate a rocky margin. The reason is, that by these means the artificial character is heightened, and also a colour is introduced between the surrounding grass, vegetation, gravel, or dug-ground, which harmonises the water with the land. Artificial shapes of this kind should never be of great diameter, because in that case the artificial character is comparatively lost, and the idea of nature occurs to the spectator. When round or square, they should not be of greater diameter than the house or building to which they belong; but a better effect will be produced by their being smaller, as is shown in the architectural basins of Italy, and the tanks of Persia and India. When of oblong forms they may be of any length, provided they are never of any great breadth; because in this case they never can be seen in such a manner as to obliterate the idea of high art, the stone margins being always in part, at least, near the eye.

Water in imitation of nature should be in ponds or basins of irregular shape; but always so contrived as to display one main feature or breadth of water. A pond, however large it may be, if equally broken throughout by islands, or by projections from the shores, can have no pictorial beauty; because it is without effect and does not form a whole. The general extent and outline of a piece of water being fixed on, the interior of the pond or lake is to be treated entirely as a lawn. If small, it will require no islands; but if so large as to require some, they must be distributed towards the sides, so as to vary the outline and to harmonise the pond with the surrounding scenery, and yet to preserve one broad expanse of water; exactly in the same manner as in varying a lawn with shrubs and flowers, landscape gardeners preserve one broad expanse of turf. The margin of pieces of water in imitation of nature, should be a refined imitation of what is seen in natural lakes. The turf should never exactly touch the water, because the green of the one and the blue of the other do not harmonise. In nature, the harmony is provided for by the water sinking lower at one time than it does at others; which leaves a dark line of soil even in the most unfavourable cases, and a narrow line of bright gravel or sand in cases best deserving imitation. As substitutes for gravel, stones may be introduced here and there; and grouped either with plants on the shore or with aquatics, and the shades and reflection of these will produce a degree of intricacy and force of effect which will complete the beauty of the scene.

In the placing of water, whether in imitation of nature or in the creation of artificial character, regard should always be had to the surrounding scenery. Water in landscape attracts the eye more powerfully than any other material, and therefore it should never be placed near a boundary or near any object to which it is not desirable to attract attention. Water in imitation of nature should also be placed in what is in reality or in appearance the lowest part of the grounds; but this rule does not apply to water in highly artificial forms.

WATER CALTROPS.—See TRAPA.

WATERING-POTS are generally formed of tinned iron painted, but a cheaper kind, nearly as durable, is formed of zinc, which requires no paint. Watering-pots are of different sizes, and in every garden having plants in pots, there ought to be three sizes: large for the open garden, smaller for plants in pots under the hand; and yet smaller, and with a long tube or spout, for pots on a shelf, or at a distance from the operator.

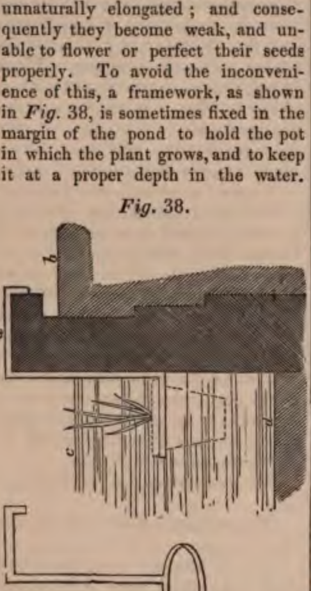
WATERING.—See WATER.

WATER-LEAF.—See HYDROPHYLLUM.

WATER-LILY.—See NYMPHÆA and NELUMBIUM.

WATER PLANTS are those which must have their roots and a portion of the stalk submerged in water, in contradistinction to marsh plants, which only need to have their roots constantly kept moist. Most water plants require to be planted, or to have their seeds sown, in a layer of soil at the bottom of the cistern or aquarium in which they are grown, if they are tender plants; or in the soil at the bottom of a pond or other piece of water in the open ground if they are hardy. Most water plants have their leaves and flowers always above the surface of the water; and others raise themselves above the water in the day, when their flowers are expanded, and sink below it at night, when their flowers are closed up, so as not to be injured by the water. To enable them to do this, if the water should be deep, the stems are sometimes unnaturally elongated; and consequently they become weak, and unable to flower or perfect their seeds properly. To avoid the inconvenience of this, a framework, as shown in *Fig.* 38, is sometimes fixed in the margin of the pond to hold the pot in which the plant grows, and to keep it at a proper depth in the water.

Fig. 38.



HOOK FOR SUSPENDING WATER PLANTS.

When plants are placed in the beds of rivers, a stone should be laid on the roots to keep them in their proper place, and to prevent them from being washed away by the stream.

Water Plantain. — *Alisma.* — *British* marsh plants.

Water Reed.—*Arúndo Dònax.* —See Arundo.

Water Starwort. — *Callìtriche aquatica.*

Water Soldier.—*Stratiòtes alòides.* — This curious British plant when rooted in the mud at the bottom of ponds or other pieces of still water, sends out long runners which rise to the surface, and there protrude roots. Then detaching themselves from the parent plant, they float about till they have blossomed and perfected their seed; after which they sink down to the bottom, where fixing themselves in the mud, they ripen their seeds, which sow themselves, and thus give birth to new plants which send out fresh runners to rise to the surface the following summer. When this plant is to be grown in pleasure-grounds or cisterns, it is only necessary to throw some plants of it into the water to which they are to be transferred, at the time they are floating about in their detached state; and at the proper season they will sink and take root in the mud at the bottom. These plants are worth growing on account of the curious manner in which they illustrate the beautiful economy of nature.

Water Violet.—*Hottonia palustris.*—See Hottonia.

Watsonia. — *Irideæ.* — Bulbous plants, very nearly allied to Gladiòlus; and which require exactly the same culture as plants of that genus. —See Gladiolus.

Wax Tree.—*Ligustrum lucidum.* —See Ligustrum.

Wayfaring Tree. — See Viburnum.

Weinmannia. — *Cunoniaceæ.* — Stove shrubs which should be grown in peat and loam, and which are propagated by cuttings of the young wood. The flowers are whitish, and something like those of the Melaleuca.

Wendlandia.—*Menispermaceæ.*—A climbing shrub nearly allied to Menispermum, formerly called Cocculus Carolinus. It requires a little protection during winter.

Wheel-barrow.—A wheel-barrow is a necessary appendage to every garden; and one intended for the use of a lady ought to be made as light as possible, and with the handles curved so as to require very little stooping. The wheel also ought to be made broad, to prevent it from injuring the walk. In addition to the wheel-barrow there may be a hand-barrow, consisting of a square basket with two long poles, so as to be carried between two persons; the use of this being to hold the haulm of sweet peas; the long stalks of perennial plants; clippings of box, dead flowers, &c., &c., which are not heavy, but which take up a great deal of room. These waste articles should be carried to the reserve-ground, where they should be laid in a heap to rot for manure. A great part of the beauty of a flower-garden depends on removing withered flowers and all unsightly objects as soon as is possible without injuring the plants to which they belong.

White Beam Tree.—*Pỳrus Aria.*—See Py'rus.

White Cedar.—*Cupressus Thyoides.*

White Vine.—*Clematis Vitalba.*—See Clematis.

Whitlow-grass.—See Dra'ba.

Whortle-berry.--See Vacci'nium.

Wild Bugloss.—*Lycopsis.*—British and American annual plants, some of which are pretty, and which will grow in any common soil.

Wild Liquorice.—*Abrus precatòrius.*--A climbing leguminous plant, with pale purple flowers, and very beautiful red and black seeds; a native of the West Indies. The root tastes like liquorice. In England the plant should be grown in sandy peat, and it requires a stove. The seeds are used for making necklaces.

Wild Olive.—Several plants are known by this name; but the one most commonly so called is the Eleagnus. Three other plants, called the Wild Olive, are the Rhus Cotinus, a kind of Daphne, and Nyssa Sylvatica, or the Tupelo Tree. Notelæa is also sometimes known by the same name.

Wild Service.—*Pỳrus torminalis.*—See Pyrus.

Wild Thyme.—*Thymus serpyllum.*

Willow. — See Salix. — Besides the botanical divisions of the genus Salix, which are very numerous, Willows are divided into three or four distinct kinds; viz., the Willows which include all the trees, and generally all that have smooth shining leaves; the Osiers, which are the shrubby species with long pliant shoots, and the Sallows, which have thick shaggy leaves. The wood of the tree kinds is white, and being very soft and elastic, it is used for making bats for cricket-players, wooden mallets, and other purposes, where wood is required that will bear a heavy blow without splitting; the Osiers are used for basket-work; and the withies, which are a diminutive kind of Osier, for tying up bundles. All the Willows grow best in moist marshy land, and they are all propagated by cuttings, which strike with the greatest facility.

Willow-herb.—See Epilobium.

Willow-oak.—*Quercus Phellos.*—An American Oak with very narrow Willow-like leaves.

Wind Flower.—See Anemone.

Winged Pea.—*Lathyrus alatus.*—See Lathyrus.

Winter Aconite.--See Eranthus.

Winter Berry.—See Prinos.

Winter Cherry—See Physalis.

Winter Cress—*Barbarea vul-*

garis.—A cruciferous plant, with handsome yellow flowers. A double-flowered variety of the common winter cress is called the yellow rocket.

WINTER GREEN—See PYROLA.

WINTER SWEET—A kind of marjoram.—See ORIGANUM.

WISE MAN'S BANANA—*Musa sapientum.*

WISTERIA—*Leguminosæ*—Climbing shrubs, with drooping racemes of beautiful purple or lilac fragrant flowers, which in shape greatly resemble those of the laburnum. The commonest kinds are ***W. Sinensis*** and ***W. frutescens***, but some other species have been lately introduced by Dr. Sieboldt from Japan. For some particulars respecting ***W. Sinensis***, see GLYCINE; and to this may be added that, in the summer of 1840, the plant in the London Horticultural Society's garden, had more than nine thousand racemes, containing in all about 675,000 separate flowers. ***W. frutéscens*** is a much smaller plant, with closer racemes of flowers, which are small and of a dark purple. It is a native of North America. Both plants require a rich soil, and to be frequently watered in dry weather.

WITCH HAZEL.—See HAMAMELIS.

WITHY.—Those kinds of shrubby willow which have long flexible shoots.

WOOD.—See ISATIS.

WOLF'S BANE.—See ACONITUM.

WOODBINE.—See CAPRIFOLIUM.

WOODROOF.—See ASPERULA.

WOOD LOUSE—*Oniscus asellus.*—These creatures are exceedingly destructive, particularly to succulent plants and dahlias. They belong to the Crustacea, and possess the power, when alarmed, of curling themselves up like a hedgehog, so as to resemble a little ball-like shell. They are fond of creeping into any dark places, and are frequently caught by laying some *flower-pots* sideways with hay in them, *near the plants* which have been attacked. They will also creep into reeds, or the hollow stalks of rhubarb, and all these traps are used to prevent their ravages on dahlias. Very frequently small flower-pots may be seen inverted on the stakes which support dahlias, solely to serve as a trap for these creatures. Woodlice were formerly supposed to be useful in medicine, but like many remedies that were formerly popular, they are now no longer esteemed. When young they are white, and in this state they are frequently found in great numbers in the ant-hills, living with the ants in perfect harmony; they are then very small, and if examined closely, they will be found to have one segment of the body and one pair of legs less, than when full grown. This circumstance, combined with the difference of colour, has led many persons to fancy the creatures found in the ant-hills to be different from common woodlice, though, in fact, they are exactly the same.

WOOD SAGE—*Teucrium Scorodonia*—One of the British kinds of Germander.

WOODSIA—*Filices*—A very beautiful kind of British fern, with very delicate leaves. One species is a native of Brazil.

WOOD SORREL.—See OXALIS.

WOODWARDIA — *Filices* — Exotic ferns, natives of North America, and Madeira.

WORM GRASS—*Spigèlia Marilándica*—A hardy perennial, with dark scarlet erect flowers, something like those of the trumpet honeysuckle. This plant, though a native of North America, does not ripen its seeds in England, and as it does not throw up many offsets, it is very difficult to propagate in this country. It is also very liable to be killed by transplanting; and thus, though well worth growing as a border flower, it is very seldom seen in British gardens. It is called worm-grass, from its efficacy as a medicine for destroying worms. There is another species, a native of Jamaica, which has no beauty to recommend it.

Worms. — The common earth-worm (*Lúmbricus terréstris*) is a most destructive creature in flower-pots. It has been ascertained that worms swallow earthy matter, and that, after having deprived it of its nourishing properties, they eject the remainder in the form of what are called worm casts, and which instinct teaches them to throw out of their burrows, to the surface, that they may not be in danger of swallowing it again. To find fresh earth, the worm is continually incited to penetrate the ground in different directions; while, after each repast, it is induced to return to the surface to eject its cast; and thus, ground inhabited by worms is sure to be thoroughly perforated and pulverised. In a field, this has a good effect, as it lightens the soil, and renders it pervious to the air and rain; but in a pot, every passage of the worm tears asunder the roots of the plant, which are pressed close together from the smallness of the space in which they are confined, and thus it does a serious injury. The common earth-worm moves by bristles, with which the rings of its body are furnished, and which enable it to move either backwards or forwards at pleasure; and it emits a slimy substance which facilitates its passage through the earth; this slimy matter adheres to leaves and other substances, which the worm drags after it along the surface of the ground, but which, as it cannot take them through its passages, they being only large enough to admit its own body, it leaves at the mouth of the hole where it disappears. When a worm is cut in two, it is generally believed that both parts will become perfect worms; but, in fact, only the part which contains the head possesses the power of throwing out a new tail; and the part containing the tail cannot form a new head. Worms are produced from eggs; and they are always most abundant in rich humid soil. When the casts are seen on the surface of earth in a pot, no time should be lost in turning out the earth on the hand, and picking out the worms. The roots torn asunder should then be thrown away, and the plant repotted in fresh earth.

Wormwood.—See **Artemisia.**

Woundwort—*Anthyllis Vulneria.* — A British plant, only found in chalky soils.

Wrack Grass.—See **Zostera.**

Wrightia — *Apocyneæ* — Hot-shrub trees, natives of the East Indies, which were formerly considered to belong to the genus **Nerium.** One of the species *W. coccínea* has splendid flowers; it should be grown in sand and peat. The other kinds have white flowers.

X.

Xanthorhiza—*Ranunculaceæ*—Yellow root. An American shrub, with very neat dark purple flowers which are produced early in spring, and handsome leaves. It will grow in any common garden soil, and it is increased by suckers from the roots.

Xantho'xylum — *Rutaceæ,* or *Terebinthaceæ* — The toothache tree. Trees and shrubs, most of which require a stove in England, and should be grown in a sandy loam. *X. fraxineum,* the prickly ash, is an American shrub, the bark of which is aromatic, and is considered very efficacious in rheumatism. It is hardy in British gardens, and will grow in any soil. *X. nitidum,* which has strong thorns on the midribs of its leaves, is used as a hedge plant in China.

Xera'nthemum — *Compositæ* — Purple everlasting flower. Very beautiful annual flowers, which may either be sown in the open ground in April, or raised on a hot-bed, and planted out in May: the only advantage by the latter plan being that the plants flower earlier. They are very beautiful, and well deserving of a place in every flower-garden.

Xerophy'llum—*Melanthaceæ*—Singular plants with long, narrow leaves, and spikes of pretty white flowers. The species are natives of North America, and quite hardy in British gardens, where they should be grown in peat and loam. *X. gramineum* is a peculiarly desirable species, from its loose and elegant spikes of small star-like white flowers.

Xerotis — *Junceæ* — Rush-like plants, natives of North Holland, which require protection in this country; and which are not worth the trouble of growing.

Ximene'sia.—*Compositæ.* — Annual and perennial flowers, natives of Mexico, with yellow flowers, which will grow in any common garden soil. There are two biennial species, which should be kept in a frame during winter, and transplanted to the open border in spring.

Xylobium.—*Orchidaceæ.* — Brazilian parasites, growing on trees, and requiring a stove in England. For their culture, see Orchideous Epiphytes.

Xylaphy'lla.—*Euphorbiaceæ.*—Very curious shrubs, which produce their flowers on the margins of their leaves. They are mostly natives of Jamaica, and require a stove in England. The flowers are generally greenish, but those of *X. montàna*, the Sea-side Laurel, are of a bright yellow. They are generally grown in sandy peat.

Xylosteum.—The Fly Honeysuckle. See Lonicera.

Y.

Yam.—*Dioscarea.* — Herbaceous plants, natives of the tropics, generally with greenish white flowers, the tuberous roots of which are eaten, as a substitute for potatoes. The stems of most of the species are weak, and cannot support themselves.

Yarrow.—*Achillea Millifolium.* —See Achillea.

Yellow Rattle. — *Rhinanthus majus* is a British plant, which is very ornamental, from its yellow labiate flowers having each a bright dark eye.

Yellow Root. — See Xanthorhiza.

Yellow Sultan.—See Amberboa.

Yellow Vetchling. — *Lathyrus Aphaca.*—A British climbing vetch, with yellow flowers, only found in sandy soils.

Yellow Wort.—*Chlora perfoliata.*—A British annual, with glaucous leaves and yellow flowers. It is always found in a wild state in chalky soils, and it will seldom grow in gardens unless the soil be chalky, or of a calcareous loam.

Yew Tree.—See Taxus.

Yucca.—*Liliaceæ, or Tulipaceæ.* —Adam's Needle. Evergreen plants with leaves like the Aloe, and sometimes a stem, or rather trunk, like a palm-tree. Some of the species have been known to have a trunk twenty feet high, sending up every year, five or six immense flower-stems, each six or eight feet high. In ordinary cases, however, the trunk is rarely more than two or three feet high, though the flower-stem frequently measures five or six feet. The flowers are bell-shaped, and generally white. The commonest kinds in British gardens are *Y. gloriòsa*, *Y. Dracònis*, and *Y. filamentòsa*. All these are natives of North America, and are quite hardy in Britain; they have all white flowers, and they are all Aloe-like shrubs, presenting the general appearance shown in *Fig.* 39, which was taken from a plant of *Y. Dracònis*. *Y. alöifolia*, on the contrary, always forms a palm-like tree, from twelve to twenty feet high; it is rather more tender, and its flowers are purplish on the outside and white within. All the kinds prefer a deep sandy soil, and they are all propagated by suckers. They will all grow close to the sea side, and are therefore very suitable for the grounds of marine villas. They also produce a good effect in vases, on the terraced garden of an Italian villa, as they form an excellent substitute for the Agaves, so common in Italy, but which are too tender for the open air in England.

Fig. 39.

YUCCA DRACONIS.

Z.

Zamia.—*Cycadeæ.*—Very curious palm-like plants, with short, tubercle-like stems, and long frond-like leaves, which are stiff and leathery, and stand erect round the stem. The remains of the footstalks of the old leaves, form a scaly kind of bark to the stem. The flowers are dioicious; and the fruit is an oblong, erect, scaly nut, which is hard and bony. The species are mostly natives of the Cape of Good Hope, but some are found in the West Indies; and one *Z. spiralis*, in New South Wales. The plants should be grown in very sandy loam, and they are generally propagated by offsets. They are very tenacious of life, and when the centre of the stem is rotten, the scale if planted will generally send up leaves, and become separate plants.

Zanthoxylum.—See Xanthoxylum.

Zea.—*Gramineæ.* — The Indian corn. An annual plant, a native of America. The plant is very ornamental, and the male blossoms are particularly elegant. It should be grown in rich mould, and it should be sown very early in spring; or it may be raised on a hotbed, and transplanted into the open ground in May.

Zebra Plant. — *Calathea Zebrina.*—Cane-like plants, with red and yellow, purple and yellow, or white flowers; natives of Brazil, which require a stove in England, and which should be grown in sandy peat.

Zedoary. — *Curcuma Zedoaria.* —See Turmeric.

Zeno'bia.—*Ericaceæ.*— The new name given by Professor Don to a genus of Andromeda.

Zephyra'nthes. — *Amaryllidaceæ.*—Cape bulbs, with very elegant flowers. Nearly all of the species are quite hardy, and only require planting like the Crocus, in a warm border, in a somewhat sandy soil; without wanting any further care, except occasionally taking them up, every third or fourth year, to remove the offsets.

Zi'chya. — *Leguminosæ.* — Mr. Bentham's new name for some of the kinds of Kennedya. See p. 149.

Zingiber. — *Scitamineæ.* — The Ginger. Stove-plants, with small flowers, which are produced in a very curious spathe, and a fleshy rhizoma, or underground root. One of the species is the common ginger.

Zi'nnia.—*Compositæ.*—Beautiful annual flowers, natives of Mexico, which should be raised on a hotbed, and planted out in May. See Half-hardy Annuals, p. 15.

Zi'zyphus.—*Rhamnaceæ.*—Half-hardy shrubs, some of which are frequently grown in British gardens. See Jujube Tree, and Paliu'rus.

Zostera. — *Fluviales.* — Wrack grass, or Grass wrack. A marine plant, common in salt-water ditches. The leaves, when dry, are tough and flexible; and they have been lately used for filling beds and cushions.

Zygope'talum.— *Orchidaceæ.* — Showy orchideous plants, which in their native state are found growing on the branches of trees, and which should be grown on wood in the stove. For their culture, see Orchideous Epiphytes.

Zygophyllum.—*Rutaceæ, or Zygophylleæ.* — The Bean Caper. Greenhouse and hardy perennials, which will grow in any common garden soil, that is somewhat loamy. They are propagated by cuttings.

THE END.

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